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ILLUMINATING ENGINEERING

Journal of the
ILLUMINATING ENGINEERING SOCIETY

The Eastgate Branch of the Central National Bank of Cleveland, Ohio, was photographed after a recent installation of 6′ x 8′ Wakefield Twenties.

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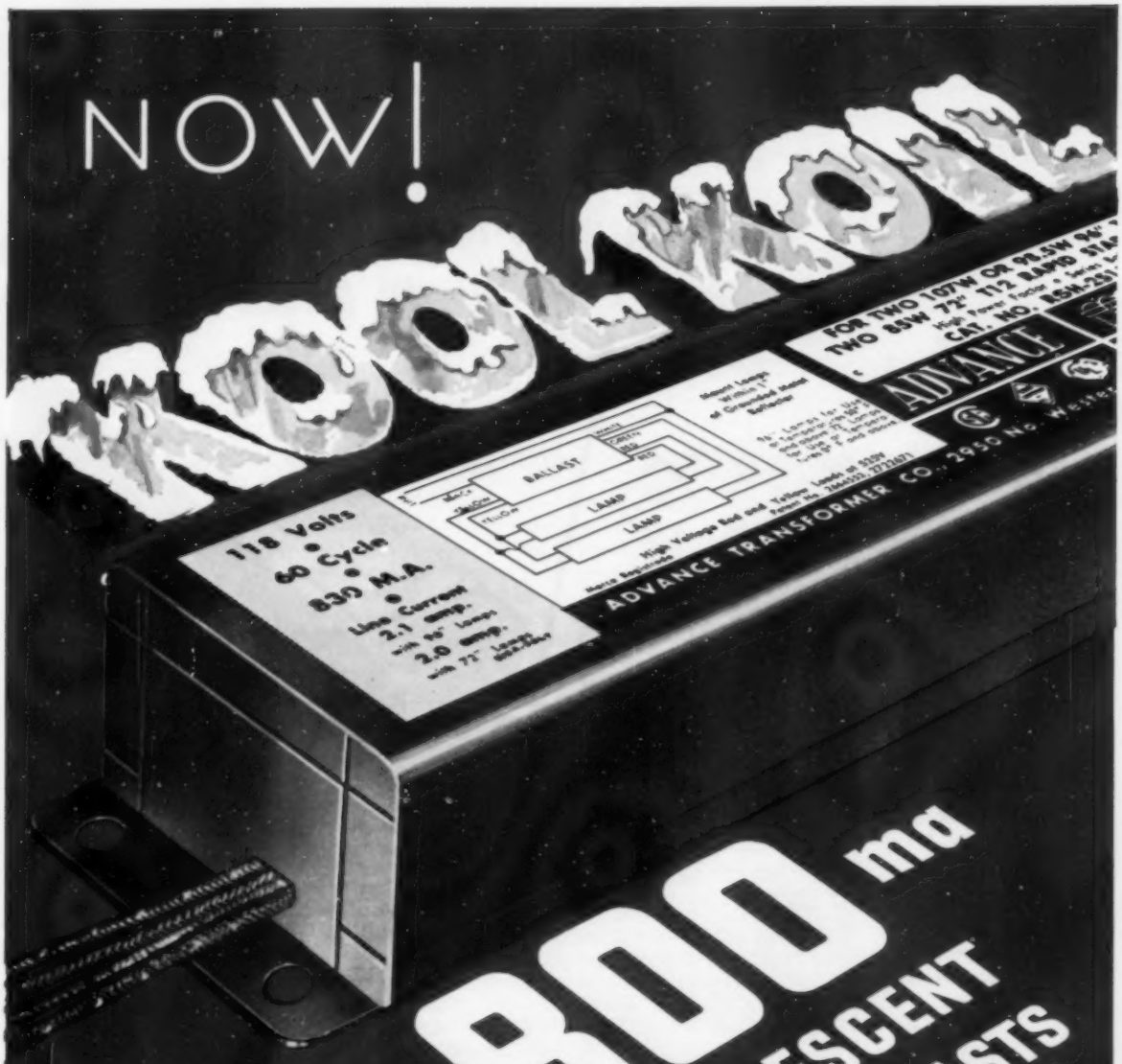

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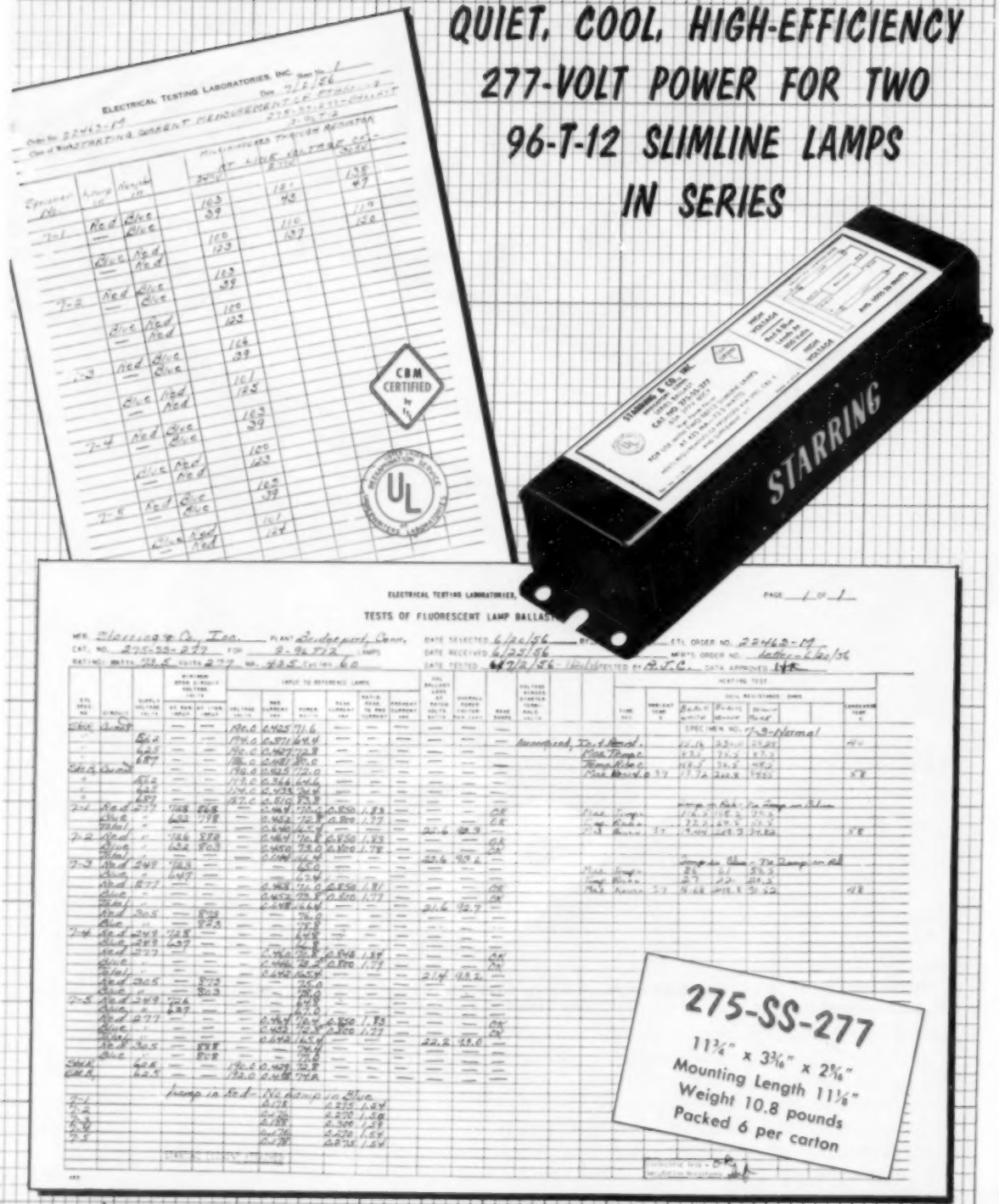

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ILLUMINATING ENGINEERING

THE JOURNAL OF THE ILLUMINATING ENGINEERING SOCIETY

October 1958

Vol. LIII, No. 10

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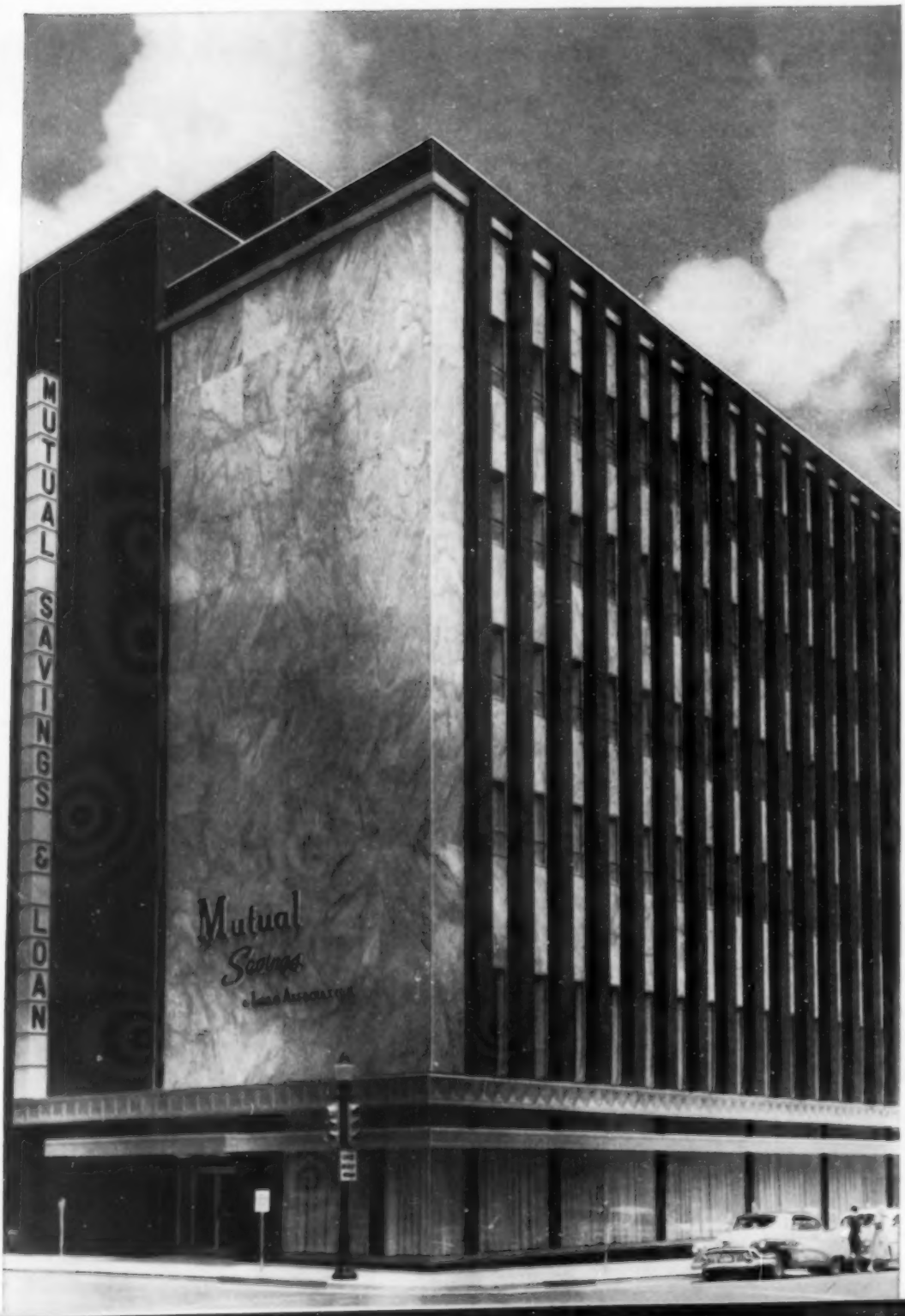

This handsome new bank and office building in Fort Worth, Texas, houses the Mutual Savings & Loan Association. Architect: Preston M. Geren. Consulting Engineer: Yandell, Cowan & Love Engineering Co.

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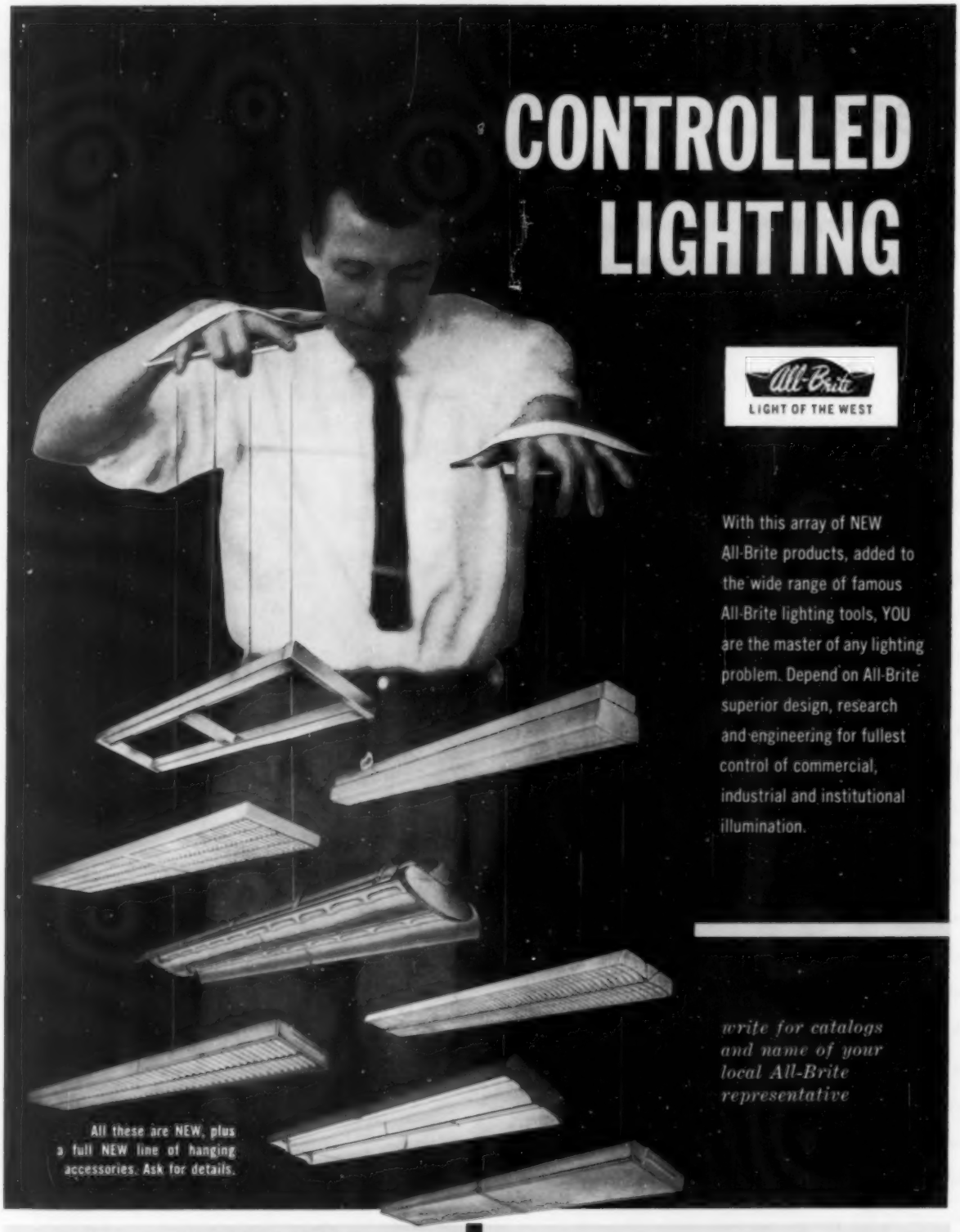
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George J. Taylor
President, 1958-1959
Illuminating Engineering Society

A PHRASE frequently heard, in the introduction of notables is — "needs no introduction." Oddly enough, the more widely known a man may be, the more likely it is that he is known for one phase in one area, quite another somewhere else. If you feel that to you George J. Taylor, IES' new President, needs no introduction, read on.

Since such a large percentage of the IES membership is acquainted with Mr. Taylor, they probably do know that he is Vice-President for Eastern Operations, Day-Brite Lighting Inc., his office being in New York City. In this he needs no introduction. Many, especially in the east, have also experienced (and benefited from) his very active service to IES—Section Chairman, Regional Vice-President, Treasurer, General Secretary, technical committees (especially office and industrial lighting, his special specialties, of several). All over the country though, Section and Chapter members have heard him speak; he has for years been a top attraction at IES meetings.

Introductions made at these meetings have included the information, probably, that he was born in Chicago, May 13, 1903, and that he graduated from Illinois Institute of Technology (then known as Armour Institute) in 1925, with a B.S. degree in Electrical Engineering. In 1926 he received an M.S. in E.E. from the Massachusetts Institute of Technology. Later, in 1933, he returned to Armour to receive his E.E. degree.

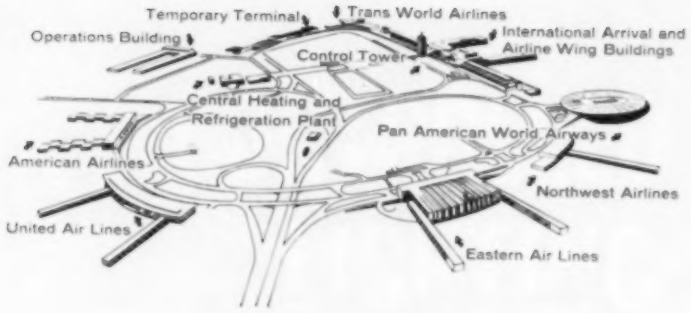
All this was only the beginning, however, for what is now a broad swath in valuable developments in illuminating engineering. His professional stature includes election to the grade of Fellow in both the Illuminating Engineering Society and the American Institute of Electrical Engineers, the former for original developments in equipments and application for industrial lighting; the latter "for contributions to the application of electrical lighting to industry." He is, of course, a biographee in "Who's Who in America" (Vol. 31), selected for his achievements in his field.

That these achievements are well documented, every reader of ILLUMINATING ENGINEERING and of the technical press, is well aware. Indeed, it begins with his college thesis in 1925, on "Industrial Illumination with Mercury Vapor Lamps," considered so thorough and useful a study, by the lighting industry, that it was later developed as a complete treatise on the subject for the General Electric Vapor Lamp Company. Since that far-off day, Mr. Taylor has presented some six major papers before the National Technical Conference of this Society (the latest at the recent conference in Toronto), and numerous other technical papers as well, in IE and other professional publications. He has been especially adept at presenting the "lighting story" to the layman, and so has also seen print many times in the trade press. To a great many readers of IE and trade magazines, he again "needs no introduction."

Other groups already well acquainted with the Society's new President, through his active service to them, are: NEMA; hundreds of distributor company trainees; U. S. National Committee of CIE, members of some 25 IES committees on which he has served (many as chairman); AIEE committee personnel; and, of course, scores of clients who have sought his consultation on the solution of their lighting problems.

Mr. Taylor's career in lighting (following his remarkable thesis) began as a design engineer with G and W Electric Specialty Company in Chicago, where he was responsible for the complete standardization of low and high voltage distribution equipment. In 1933 he moved to Hoboken, New Jersey to serve as commercial engineer for the General Electric Vapor Lamp Company. During this time he was in charge of research on all new products. These included the development of the first industrial luminaire using a rectified fluorescent lamp and the first 400-watt "high intensity" mercury lamp in luminaire. With the absorption of the Vapor Lamp Company, in 1939, Mr. Taylor was transferred to the General Electric Lamp Division at Nela Park, Cleveland, Ohio, where he headed the Industrial Lighting activities for the Engineering Division. At the start of World War II he was a consultant for G-E on the large industrial lighting program for war plants. He continued this work in the New York area after his transfer in 1942, pioneering the group replacement plan for efficient use of lamps and luminaires in large industrial plants. He left General Electric in 1945, and spent two years as a Consulting Illumination Engineer, applying illumination for specific application related to the scientific solution of involved seeing tasks. In 1947 Mr. Taylor joined Day-Brite Lighting Inc., and is presently a Vice-President of the company, in charge of all Eastern Operations involving technical and sales matters relating to illuminating engineering.

Father of two (daughters), grandfather of four, President George Taylor will no doubt still further extend his acquaintance with IES members as he visits each of the Regions during their conferences next Spring, accompanied by his charming wife, Olive.



Artist's rendition, right, and drawing, above, show how Terminal City at New York's International Airport will appear upon completion. Not all of the unit terminal buildings for the major United States-Flag lines have as yet been constructed.

Terminal City

FACTS and FIGURES

SIZE AND LOCATION: 655 acres in central area of New York International Airport (operated by the Port of New York Authority, under lease with the City of New York). If placed on Manhattan Island, Terminal City would cover the area between Third and Ninth Avenues from 33rd to 57th Streets.

UNDER CONSTRUCTION BY: The Port of New York Authority.

CONSTRUCTION DATES: Started March 10, 1955, International Arrival Building and Foreign-Flag Airline Wing Buildings opened December 5, 1957. Entire Terminal City — 1960.

FACILITIES: International Arrival Building and two adjacent Foreign-Flag Wing Buildings (eleven city blocks long). Individual terminal buildings for United States-Flag airlines.
Central heating and refrigeration plant.
Four parking lots with a combined capacity of 6000 cars.
220-acre landscaped International Park with Fountain of Liberty.
7½ miles of taxiways. 10 miles of two-lane roads.
An 11-story-high control tower.

INTERNATIONAL ARRIVAL BUILDING: Dominant structure in Terminal City. Three stories high, 640 feet deep. With the two Airline Wing Buildings, over-all length is 2,300 feet. Has 362,000 square feet of floor space housing all customs, health and immigration inspection services. Contains Golden Door Restaurant and Cocktail Lounge, coffee shop, barber shop, book store, florist, jewelry shop and waiting rooms.

WING BUILDINGS: 230,000 square feet of floor space. House ticket counters, lobbies and offices for fourteen Foreign-Flag airlines. Four double-decked arcades provide a total of 1000 feet of enclosed passage to 24 aircraft positions. 4000-foot-long open observation deck at third-floor level.

AIRLINES: Twenty Foreign-Flag airlines and 16 United States-Flag airlines are certified to serve New York International Airport for passengers, mail and cargo.

AIRCRAFT POSITIONS: When individual terminal buildings for the United States-Flag airlines are completed, there will be provision for 140 aircraft positions. Serving the International Arrival Building and the Airline Wing Buildings there are 24 aircraft positions. This number will be increased as additional positions are required.

ESTIMATED COST:

International Arrival Building and adjacent Foreign-Flag Airline Buildings	$30,000,000
Roadways, taxiways, parking lots, utilities and landscaping	16,000,000
Unit terminal buildings (for individual U. S.-Flag airlines)	97,000,000
Central heating and refrigeration plant	7,000,000
Entire Terminal City	$150,000,000

Aerial Gateway to the United States

ONE OF THE world's most beautiful lighting jobs is a part of America's first impression on many foreign arrivals at Idlewild.* What they "see" approaches the lighting man's ideal of architect-engineer-consultant collaboration. Details of this enormous project — its size, its concept, its superior architectural design and its outstanding efficiency and beauty — have been described in several publications since the opening ceremonies last December. Of additional interest to IE readers, however, might be the sensitive appreciation of its planners for the importance of its lighting design. They would no doubt consider well-spent, the months the Port Authority engineers "lived" with this lighting project, and well-advised, consultations with such men as Richard Kelly, Abe Feder, and others.

Many skilled hands, in several professions, have obviously been employed in this project. To wit: In its entirety, Terminal City (artist's rendering above) was conceived and planned by the Port Authority Aviation Planning Division under the direction of Thomas M. Sullivan. Detailed plans were developed by the Port Authority staff with the consultation of Wallace K. Harrison, world renowned architect of Rockefeller Center, United Nations Building and other famous developments. The Design Division of the Port Authority's Engineering Department developed and prepared the mechanical, electrical, civil and structural engineering plans for the International Arrival and Airline Wing Buildings. John M. Kyle is Chief Engineer for the Port Authority; Irvine P. Gould, Engineer of Design; L .F. Booth, Engineer of Construction, Claude E. Sanford, Design Project Supervisor. Architectural design was by Skidmore, Owings, and Merrill, architects for such famous structures as the Air Force Academy and New York's Lever House.

Most closely connected with the lighting design of the eleven-block-long Arrival and Airline Wing Building were Henry W. Wenson and S. Leo Perlstein (IES members) whose detailed description of the techniques employed is published in this issue. Abe Feder's lighting for Liberty Fountain is also recorded, on page 531.

*Popular term most widely used. Official name — New York International Airport.

Figure 1. Exterior of Parabola.

TERMINAL CITY

International Arrival Building

By HENRY W. WENSON
S. LEO PERLSTEIN

Figure 2. Interior of Parabola.

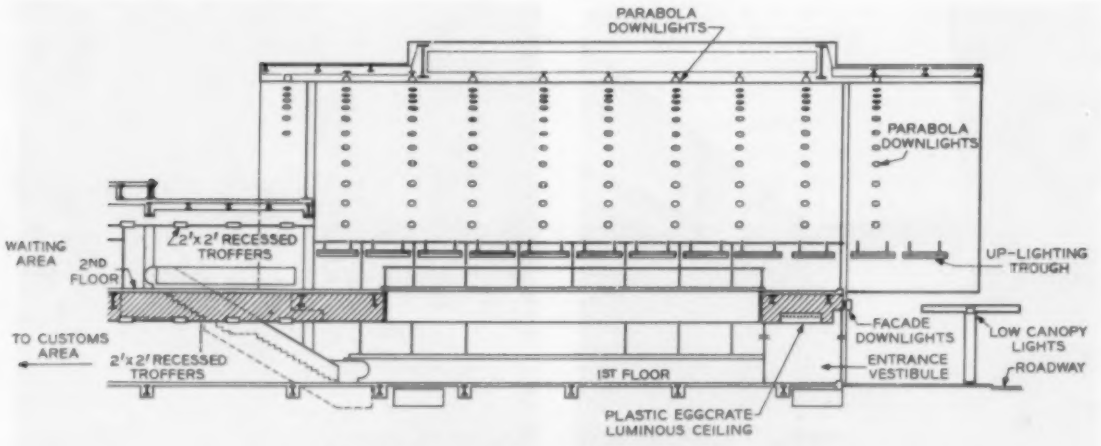


Figure 3. Section through center of Parabola.

DESIGN of Terminal City was dictated by the need for efficient and convenient handling of the great numbers of people and goods expected at New York International Airport. With as many as 11,100,000 passengers a year expected by 1965, some three million or more overseas passengers alone, a single terminal building to serve such traffic would have required a structure over two miles long. Only the flights requiring clearance through Customs and other Federal inspection services, therefore, have been concentrated in a single structure — International Arrival Building. Each airline will have its own separate facility for handling flights not subject to such clearance.

Foreign-flag airlines occupy space in the two Airline Wing Buildings. The design of Terminal City provides a number of sites around the oval-shaped perimeter of the terminal area on which major United States-flag lines are constructing individual terminal buildings. Those sites (clockwise around the perimeter from the International Arrival Building) have been leased by: Pan American World Airways, Northwest Airlines, Eastern Air Lines, United Air Lines, American Airlines, Trans World Airlines.

International Arrival Building is the dominant structure in Terminal City, and symbolizes the airport's international character. It will handle all international air travelers entering the United States through the Port of New York and thus will be the country's air age front door. It is three stories high and 640 feet deep, with the two Airline Wing Buildings, giving it an over-all length of 2,300 feet, or eleven city blocks. The Arrival Building itself has 363,000 square feet of floor space, housing all customs, health and immigration inspection services, as well as the unique Golden Door Restaurant and Cocktail Lounge, coffee shop, barber shop, book store, florist shop, jewelry shop, and waiting rooms. The Wing Buildings, with a total of 230,000 square feet of floor space, house ticket counters, lobbies and offices for fourteen foreign-flag airlines as well as a consolidated service for handling passengers on other lines or on itinerant aircraft. Four double-decked arcades provide a total of 1,000 feet of enclosed passage to twenty-four aircraft positions. A 4,000-foot-long open observation deck extends the full length of the buildings and arcades at the third-floor level.

Lighting application for the various areas of the terminal are understandably varied since the lighting installation equipment was designed to complement the architectural features. In the development of the design, four cardinal factors were taken into consideration, namely: (a) aesthetics, (b) efficiency, (c) brightness ratios and glare, and (d) maintenance and safety.

Perhaps the widest assortment of lighting techniques is found in the entrance Parabola (Figs. 1, 2 & 3). This unit has a parabolic arched ceiling 45 feet high at its midpoint and a peripheral mezzanine. All four exterior walls are plate glass from floor to ceiling except a portion of the south wall where the Parabola connects with the remainder of the Arrival Building.

Overhanging the sidewalk and extending for the entire length of the Arrival Building is a free standing canopy supported on a single row of columns. A row of glass-panelled 8-foot recessed troffers mounted on 12-foot centers along the cen-

AUTHORS: Electrical Engineer and Electrical Designer, respectively, Port of New York Authority, New York, N. Y.

Figure 4. One of two entry vestibules, lighted by luminous ceiling to 75 footcandles.

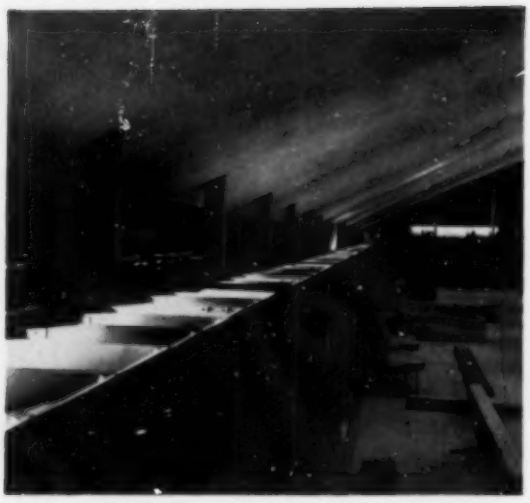


Figure 5. Special trough-like fixtures along entire length of east and west walls.

terline of the canopy between the supporting columns illuminates the sidewalk to a level of 20 footcandles at the curb line.

The main entrance to the Parabola is highlighted to a level of approximately 200 footcandles by 34 baffled downlights, side mounted on the facade on 4-foot centers and mounted 12 feet above the floor. The units use 300-watt PAR56 medium floodlamps aligned so that the wider axis of the beam is parallel to the building. This punch of light offers a bright welcome to travelers arriving at the terminal as well as clearly defining the entrance.

For a gradual transition from outdoors to indoors, the two entry vestibules are lighted to 75 footcandles by 6- by 20-foot islands of plastic eggcrate luminous ceiling above which are fifteen 72-inch T12 slimline lamps (Fig. 4).

To emphasize the focal point of the terminal area it was decided to floodlight the arched ceiling so that the building would stand out in its highly illuminated surroundings. To add shadow, shape, and form to the contents, it was also desirable to incorporate downlighting.

For the Parabola downlighting, the height of the ceiling favored the use of top access units. However, the structural framing and the limited clearances between the outer roof and the suspended ceiling ruled out their use. For simplicity, economy and ease of maintenance, open downlights using screw base lamps were desirable. The fixtures chosen to suit these requirements were low brightness downlights with Alzak aluminum reflectors.

Each row of downlights was specially tailored to conform with the contour of the ceiling at the particular elevation so that the axis of all lamps and reflectors is vertical, and so that the cut-off angles of the shielding baffles are uniform. Since the mounting height of the fixtures was to vary from 10 feet on the mezzanine to 45 feet in the lobby area (and architecturally a uniform modular pattern was desired), a point-by-point calculation of the illumination was necessary. Photometric data of the fixtures designed for a 12-degree slope was used to simplify calculation since this was the mean angle of all the units.

To obtain equal and uniform illumination on both the mezzanine and lobby floors, it seemed initially as if the fixtures at the higher mounting heights should be of greater wattage than those mounted much lower. However, the results of the calculations indicated that with a uniform pattern of a given size lamp, the lighting level was uniform and equal throughout the area despite the great disparity in floor to ceiling heights.

For a maintained illumination level of 15 footcandles of direct component (neglecting interreflections) the fixtures were spaced on 8-foot by 10-foot centers, and lamped with 200-watt PS30 lamps. The circuiting is arranged so that should the need for a higher lighting level arise, 300-watt PS30 lamps could be used in the same fixtures increasing the light output by over 50 per cent.

For the uplighting of the arch, special trough-like fixtures were designed and mounted two feet from the ceiling and on 8-foot centers along the entire length of the east and west glass walls. Each trough is seven feet long and contains ten 500-watt R40 spotlamps mounted in cast aluminum housings (Fig. 5). For uniform illumination on the ceiling, alternate lamp housings in the trough are aimed at

Figure 6. Airlines ticket counters beneath side mezzanine with eggcrate louvered troffers.

the same fixed angle and are commonly connected by a shaft which permits the lamps to be adjusted in groups of five, five degrees upward or downward from the theoretical aiming angles. This adjustment was incorporated in the fixture to compensate for tolerances in the building construction and to take care of lamp variations.

The areas of the arched ceiling which extend outside of the glass line are illuminated by means of special exterior ground light fixtures which are buried in the ground on 8-foot centers. Each box contains two 300-watt PAR56 medium floodlamps mounted in weatherproof cast aluminum fixtures. The complete unit is suitably baffled to be as inconspicuous as possible.

With the scheme of uplighting the average illumination at the ceiling, which is yellow-ivory in color, is 37 footcandles, while the average illumination at the floor resulting from the uplighting is 12 footcandles.

The entire uplighting installation, as well as the main entrance facade downlighting, is dimmer controlled. Dimmers are motor-operated auto-transformers and have a 20-minute period of travel from full brightness to blackout. All dimmers are operated from a remote control panel, control being accomplished by means of levers with numbered indicator drums. The complete dimming system is equipped with a master control panel having a five state pre-set, each of which can be adjusted to any desired level of illumination. The entire sequence of the pre-set mechanism is controlled by an astronomical time switch. In addition, a master fader and a time delay device are provided so that the transition from pre-set to pre-set is gradual, taking about five minutes. Five changes of pre-sets take place daily. Changes of the pre-set levels as well as time when each level takes place, are of course adjustable.

While the downlighting is not on dimmers, it is controlled by means of an astronomical time switch and a 48-hour cycle timer actuating contactors in such a manner so that all of the lights come on at dusk and only half go off some time around midnight on one day, while the other half go off at midnight the following day. At dawn the half which happened to be "on" goes "off." In this way all lamps receive the same usage and group replacement is simplified.

Brightnesses and illumination levels were measured recently with only the downlights "on," five months after the installation had been completed. On the first floor of the Parabola all points within the opening of the mezzanine measured 20.5 footcandles, while readings on the mezzanine ranged from 19 to 22 footcandles; the highest level occurring under the row of downlights nearest the floor.

Brightness measurements in the Parabola taken with a Luckiesh-Taylor brightness meter are shown in Table I.

With the uplighting turned on, the ceiling brightness is such that the downlights are barely discernible.

Airline ticket counters located on the first floor of the Parabola beneath the side mezzanines are illuminated by continuous rows of three-lamp 2- by 4-foot eggcrate louvered troffers having 40-degree shielding in both directions. Louvers are finished in light gray to minimize brightness. While the illumination on the white laminated plastic counter tops is 75 footcandles, the brightness of the fixtures at the cut-off angle is only 60 footlamberts. The white metal pan ceiling in this area reads 12 footlamberts (Fig. 6).

Federal Customs area which is the largest service area in the Arrival Building is 644 feet long by 80 feet wide.

The Concourse above the first floor is glass enclosed permitting those meeting incoming passengers to watch their friends and relatives being processed through the necessary formalities. The entire area including the Concourse is illuminated by a "wall-to-wall" luminous ceiling which is 644

TABLE I.

Surface	Brightness	Material and Color
Ceiling	8 fL	Acoustic plaster — yellow ivory
Floor	13 fL	Terrazzo — tan with dark brown chips
Walls		Plate glass
Face of mezzanine	14 fL	Laminated plastic — white
Downlight baffle at cut-off	45 fL	Steel — matte black

Figure 7. Federal Customs area—644 feet long by 65 feet wide, with glass-enclosed Concourse above for those meeting incoming passengers.

feet long by 65 feet wide, and 24 feet above the first floor (Fig. 7).

The diffusing medium of this ceiling is corrugated vinyl sheet run in anodized aluminum tracks parallel to the length of the area. The ceiling is interrupted every 20 feet by a 2-foot wide separator band in which are installed the air-conditioning diffusers, return air grilles, and the loudspeakers for the public address system. Above the ceiling are twenty-nine rows of slimline lamps spaced 2 feet 2 inches on centers and operating at 200 milliamps.

The illumination level at the first floor where the customs counters are located (Fig. 6) and on the second floor concourse level is 50 footcandles maintained, while the ceiling brightness is 120 footlamberts at 90 degrees and 75 at 10 degrees.

The installation is such that the illumination level can be cut in half, while still maintaining a uniform ceiling brightness. This is accomplished by keeping a proper ratio between the center distances of the lamps and the lamp height above the ceiling even when alternate rows of lamps are extinguished.

Fig. 8 is an illustration of the waiting area on the second floor between the entrance lobby and the concourse above the Customs area. Here, because of the low ceiling height (9 feet), 2- by 2-foot six-lamp louvered recessed troffers were used. The louvers are finished in gray, and have a brightness

Figure 8. A waiting area on the second floor, with louvered recessed troffers in 9-foot-high ceiling.

Figure 9. One of two Public Health and Immigration areas.

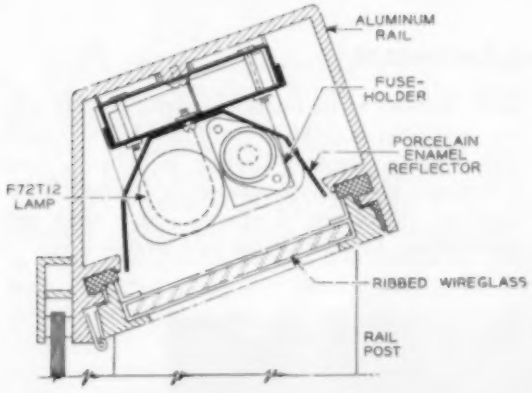


Figure 10. Observation deck, lighted by railing units.

of 120 footlamberts at 40 degrees cut-off, which exactly matches the brightness of the luminous ceiling in the immediate background. The two Public Health and Immigration areas are also illuminated by luminous ceiling similar to that in the Customs Area (Fig. 9). It may be of interest to note that there are over 60,000 square feet of luminous ceiling, and five miles of fixtures in these areas alone.

The 4000-foot long open observation deck is lighted for its entire length by special fluorescent fixtures which are built into the deck railing (Fig. 10). The lamps used are 72-inch T12 slimline, spaced 8 feet on centers with each two lamps connected to a remote two-lamp ballast. The ballast is concealed in the rail between its corresponding lamps. The underside of the rail is tilted approximately 20 degrees from the horizontal and is equipped with hinged doors containing ribbed wireglass diffusers. While the deck is amply lighted there is no glare present to hinder the viewing of the arrival and departure of aircraft. Horizontal illumination at the floor across the 12-foot width of the deck varies from 30 footcandles at the rail edge, to 2 footcandles at the far edge. Vertical illumination at these points is 12 and 3 footcandles respectively.

Arrival and departure aprons are floodlighted by arrays of incandescent and mercury vapor reflector lamps mounted on aluminum poles located on the observation deck approximately 200 feet on centers (Fig. 11). Each pole is equipped with six 500-watt

Figure 11. Floodlighting of arrival and departure aprons.

R40 incandescent flood lamps and three 400-watt R60 mercury vapor reflector lamps, mounted in cast aluminum housings. All lamps are of the outdoor type.

Wherever practicable the fluorescent lighting is operated at 277 volts, being fed from 480/277-volt 3-phase, 4-wire panelboards. For control of this extensive lighting installation, as well as a multitude of mechanical equipments throughout the building, various methods of control were studied. The system decided upon was an electronic carrier control in which switching and programming is accomplished without special wiring, by transmitting high frequency carrier currents over the standard 60-cycle electrical distribution system. One hundred and eighty individual electrical functions can be controlled automatically or manually through the use of electronic coded relays tuned to specific code impulses. These relays are installed adjacent to contactor panels, motor starters, etc., and electrically connected thereto, providing a path to turn the units on or off.

Central control point for this electronic carrier system is located in the Watch Engineer's Office. While the primary consideration for the installation of this system was the control of utility functions, synchronized clock control throughout the building was additionally realized.

To retain the international atmosphere of the terminal, the foreign airline carriers in the Wing Buildings were given a free hand in the design of their own premises. A few examples of these are illustrated in the photographs shown on pages 533-535.

TERMINAL CITY

The Golden Door Restaurant

Occupying the glass-walled penthouse at the International Arrival Building, The Golden Door offers luxurious decor, service and cuisine, and a view of plane arrivals and departures, International Park with the Fountain of Liberty, and in the distance the New York City skyline. Intimacy is the keynote of its interior design. Seating 400, the restaurant is architecturally divided into eight dining areas. General lighting is indirect, from coffers and coves, supplemented by recessed downlighting. Walls are of oriental grass cloth and cherrywood. Interior design by Florence Knoll.

TERMINAL CITY

Fountain of Liberty

By ABE FEDER

A PRINCIPAL feature of International Park at New York International Airport is the beautiful Fountain of Liberty.

Water in motion under light has given man pleasure for at least as long as pleasurable things have been recorded. When, therefore, a lighted fountain display was planned for Terminal City, to be set in a 200-foot lagoon, it seemed a particularly appealing idea. For here in this place designed as a physical link between many lands, the "liquid light" of a fountain would be an aesthetic link between all the peoples who beheld it.

The job held special challenge because America is only on the threshold of elevating the fountain to the realm of the fine arts — as Europeans have for centuries — and recognizing its unique qualities as a source of restfulness, endless fascination and beauty.

The over-all design agreed upon for the fountain display at Idlewild featured a center jet 60 to 70 feet high, a circle of eight satellite jets, and a perimeter circle 75 feet in diameter composed of a curtain spray of 860 jets. The water would be illuminated by colored underwater lights patterned like jeweled necklaces, one within the other.

The basic problem was, of course, to give color and motion to the light and water. A three-color system, in shades of blue, green and red, seemed to offer the best solution, with dimming apparatus to be used for producing graded tints as one color changed into another. Since existing apparatus for underwater lighting was large and bulky, however, proper color coordination was extremely difficult even with the most judicious placement of the equipment.

When the first budget was set up, the cost of achieving a smooth color balance with this apparatus proved prohibitive. In fact, with such a system one-third more fixtures were required than were eventually developed especially for this project. Furthermore, the dimming apparatus, since it would have had to be completely motor-operated, comprised an overly large part of the budget.

In re-examining the total plan, the possibility of reducing to a two-color pattern was investigated. One key color would be used for the curtain, the satellites and the center jet (a deep blue-green), with three different variations of another color (red) for the second circuit. Tests made on a miniature fountain demonstrated that this plan would achieve an effective color counterpoint within a harmonious whole.

Then came the difficult matter of producing, *without* dimmer apparatus, the illusion of higher and lower color intensities synchronized with the different kinds of regulating required by pumps, jets and curtain. After exhaustive tests, the method now in operation was evolved. Staggered units within each group are snapped off and on, creating

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AUTHOR: Lighting by Feder, New York, N. Y. Planning and design by Port Authority Engineering Staff.

the effect of a dimmer break through the whole fountain display sequence.

In one sequence, for example, the display starts with the satellite jets rising from the lagoon, illuminated in intense orange red. The curtain comes up next, in warm amethyst, while blue green is added to the satellites to "dim them up." The center jet in bright salmon then becomes visible for the first time. White light is soon added to the salmon to alternate the color yet intensify the glow of the jet.

Variations of this pattern continue for about six minutes culminating in a finale in which the water disappears into the lagoon, bursts up into the air in full, brilliant light, and then subsides.

In the struggle of lighting versus the elements, the problems entailed in using light under water are probably the worst. Of necessity, it is an expensive process. To function successfully and to achieve longevity, the apparatus used at the Idlewild Fountain consisted, among other things, of cast aluminum underwater floodlights, waterproof, watertight and able to withstand pressure. By selecting PAR type reflector lamps for this purpose, maintenance of reflectors was reduced and better directional control was achieved.

Fountain Layout

Units used are 128 500-watt PAR64 underwater floodlights and 180 300-watt PAR56 underwater floodlights. Total wattage is 118,000.

Each fountain component has the following variety of colors: A — Center jet — 3 colors; B — Curtain jet — 2 colors; C — Satellite jets — 2 colors.

The 500-watt PAR64 units contain spot and medium floodlamps to achieve complete distribution of light over the entire height of water component. Construction of the underwater units permits individual targetting so as to achieve required effect through use of the spot or medium floodlamps. The 300-watt PAR56 units all contain floodlamps which permit maximum coverage, with minimum number of fixtures. Each underwater unit is mounted on a frame. Frames are in turn secured to the concrete fountain floor, and each frame has provision for adjusting the height of the underwater floodlight units for maximum targetting efficiency. This also permits the individual floodlights to be raised completely out of the water for relamping or replacing of the color filter without having to drain the entire fountain.

The fountain measures 200 feet in diameter. Heights of the fountain components are as follows:
A — Main jet — maximum height — 75 feet
B — Curtain jets — average height — 18 to 25 feet
C — Satellite jets — 25 to 35 feet

Within the limitations imposed, the fountain at the New York International Airport, fulfills its purpose aesthetically and practically. Hundreds of thousands of people have come to see it, most of them watching for considerable lengths of time. This is gratifying indeed for, after all, it is the audience that counts the most.

TERMINAL CITY

Central Heating and Refrigeration Building

Glass walls of the Central Heating and Refrigeration Plant, facing Liberty Plaza in Terminal City, permit a view of the vari-colored pipes, boilers, electrical conduits and other equipment. This building was awarded first prize in the Industrial Building Classification of the Annual Building Awards of the Chamber of Commerce of the Borough of Queens.

The departure areas of the Foreign-Flag Airlines at New York International Airport, housed in the East and West Wings, were designed and lighted according to the plans of the individual airlines. Some of those which are now completed are shown here, with the credits as given by the airlines. All photographs are courtesy of the Port of New York Authority.

TERMINAL CITY

Foreign-Flag Airlines

Air-France — West Wing Building

International aspect of this airline is carried out through the use of exotic woods, ceramics, mosaics and furniture design, accenting various world destinations reached by Air-France. Check-in lobby on the ground floor has terrazzo floors and wood-paneling, highlighted by marble and bronze. A mural map covers one entire wall. Tourist lounge on the second floor has a service area for food and refreshments, colorfully decorated with the shields of the French provinces. Recessed lights and specially designed coves are used in both areas.

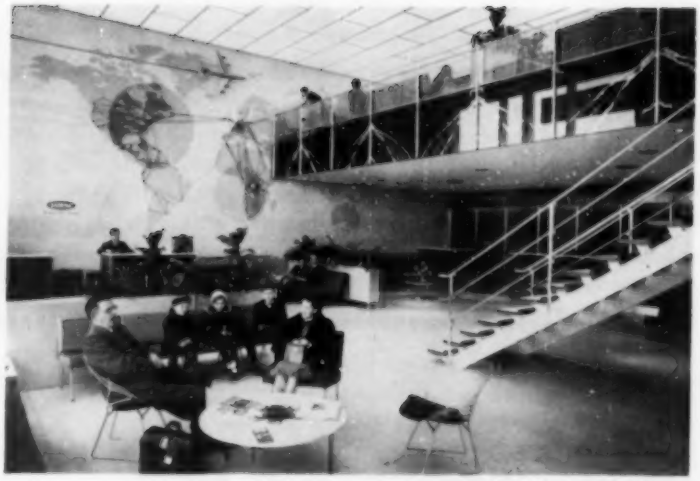
Terminal facilities were designed by Marvin Affrime and Robert Becker; architects, Itkin Affrime and Mr. Becker.

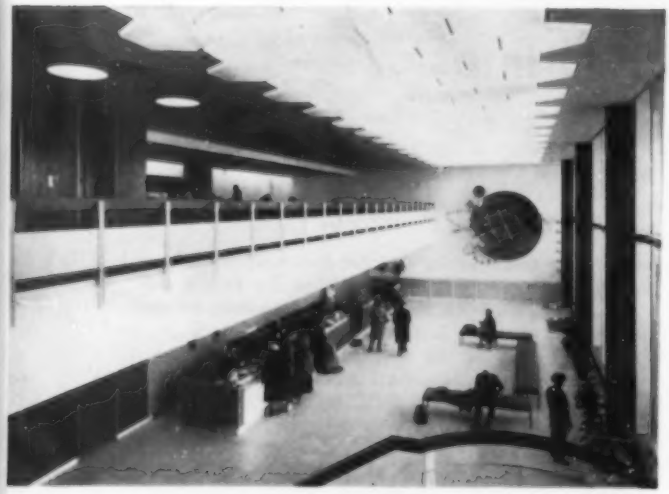
Tourist lounge.

Ground floor.

Sabena — West Wing Building

Belgian and Belgian Congo materials have been used, wherever possible, at the Belgian Airlines departure area. In the decoration, Congolese woods and leather have been used, and one large wall is covered with a map of the Sabena network, specially designed in Brussels. A plate glass wall, two stories high, permits travelers to observe the activities of the airfield. A luminous ceiling is used over the entire area, with recessed lighting for under the mezzanine. Design of the area is by Lawrence Lerner of Michael Saphier Associates.





KLM-Royal Dutch Airlines — East Wing Building

A continuous row of white plastic hexagonal panels, partially recessed in the acoustical ceiling, lights the main hall and lounges. The pavilion decoration is a blend of American and Dutch art, with a plastic map symbolizing world-wide flight, designed and executed by Lily Swann Saarinen. A hand-woven Dutch tapestry covers the full length of the east wall, and a globe, depicting the Royal Dutch Lion encircling the earth with airplanes, is mounted on the west wall of the room.

Teakwood stairs lead from the first floor passenger hall to the mezzanine lounge, rising over a flower-ornamented pool. The pavilion's over-all color scheme follows the KLM tradition — silver-gray and blue, with accents of yellow and red.

Architects were Antonin Raymond and L. L. Rado, New York, N. Y.; coordinating architect, W. T. Hart of KLM; contractor, Cauldwell & Wingate, New York, N. Y.

Swissair — West Wing Building

Decorative treatment of Swissair's departure facilities include a simple modernistic stainless steel frame, suspended from the 23-foot high ceiling, with a cluster of four electric clocks, an important symbol of the airline's home base. Another display features a revolving three-sided prism device which turns to show either mirror-glass or photographs and paintings of round-the-world scenes.

A stairway leads up from ground level to the mezzanine and second floor lounges. Lounges and stairway are fitted with ochre-brown carpeting.

Lighting is by recessed downlights in both areas.

Facilities were designed by Haefeli, Moser, Steiger of Zurich and John R. Weber of New York.

Lufthansa German Airlines — East Wing Building

The colors used in this departure area are, to a large extent, the airline's traditional blue and yellow. Under the mezzanine are the checking-in and information desks, lighted by large luminous square panels. The mezzanine, which contains a waiting room, rest rooms and lounges, has a luminous ceiling which extends out over the main lobby on the first floor.

Over-all design was executed by G. B. and R. M. Ollinger of New York, N. Y.

BOAC — East Wing Building

Largest of the Foreign-Flag Airlines, the British Overseas Airways Corp., occupies two floors adjacent to the Terminal City Arrival Building. Its frontage, which consists entirely of glass, is 200 feet in length. Checking-in facilities on the ground floor are lighted by a luminous ceiling element, while the over-all lighting of the lobby and mezzanine is by recessed downlights. The decorative treatment includes coats of arms of English cities. All counters and woodwork are of teak. Bar furniture on the mezzanine was imported from England, and the waiting room furniture is upholstered in Scotch leather.

Norman Haile, BOAC Headquarters senior architect, supervised the planning in cooperation with New York Architects La Farge, Knox & Murphy and consulting engineers, Levy & O'Keefe. General decorative scheme was developed by London designer Beverly Pick along the lines of BOAC's standard world-wide decor.

Scandinavian Airlines System — West Wing Building

The simplicity of modern Scandinavian design is carried out in the interior decoration of the mezzanine lounge of SAS. Thirty-three custom-made sofas in burnt orange fabric and walnut cocktail tables form conversation groupings. Walnut tables, each with six chairs in muted fabric, fill the center of the room. Lighting is by recessed units and coffers.

The first-floor check-in center (not shown) is decorated in soft green walls and mosaic pillars, and one entire wall is a glass facade overlooking the grounds.

Guy Brink, AID, San Marino, Calif., is decorator; Kahn & Jacobs — Roy S. Bent Associates, architects; construction by Humphreys and Harding.

High Levels In Offices

Higher even than the new recommended minimum levels specified (August IE, page 430) for most difficult office tasks are those in these two offices.

In a New York City office, above, 300 footcandles are provided on the desk after 100 hours operation from a "ceiling" formed from two-lamp units and colored plastic panels. The 8-foot F96PG17 lamps are mounted above louvers in the lamp compartments, supplying downlight directly and uplight which is diffused from the ceiling through the egg-crate plastic panels. Panels in this installation are a light green. Brightness ratio between the white louvers under the lamps and the intermediate panels is 3:1. Units here are hung on 16-inch suspension rods, but this can be varied with ceiling height.

Light surfaces are used throughout. Rug is light gray, walls are gray, background of draperies is gray and visitors' chairs are light coral. Photo and data courtesy of Silvray Lighting Inc., Bound Brook, N. J.

Office of the president of Cleveland Electric Illuminating Co. (left) receives 425 footcandles at desk level, from a luminous ceiling of ½-inch thick Plexiglas sheets framed with aluminum. Above the plastic ceiling 485 four-foot rapid-start lamps, on dimmers, are mounted in white baked enamel fixtures. Units are in parallel rows and lamp centers are 2½ inches.

Holes are provided in the frames for the insertion of the wooden baffles. Air-conditioning equipment is mounted above the fixtures on one side of the room and the return on the other. Photo and data courtesy Lumenated Ceilings Div., Thermotank Inc., Detroit, Mich.

Brightness Survey of Two Rooms Using a Photographic Technique

By M. N. ZEOLLA

In daylighting surveys, measurement of the brightness levels and patterns that exist within a room is most important. Visual comfort depends on the extent, pattern, and range of brightness in the field of view. Several methods are available for brightness measurement and recording. All have their advantages and disadvantages. The time consumed in surveying the brightness in large areas is one of the major drawbacks of most of the methods.

The interior illumination and brightness produced by the use of daylight varies with the available outdoor light. Since the outdoor conditions are constantly changing, a method of brightness recording, that would permit almost instantaneous survey of large areas, would be most valuable. Also, the method should permit making measurements under actual use conditions to obtain values that are realistic and therefore useful.

A photographic method, that is most convenient and effective for such purposes, has been developed by Professor and Mrs. Charles Marsh, of the Pennsylvania State University, under the sponsorship of Pittsburgh Plate Glass Company.[1]

This method requires the use of only a compact three-plate camera and a Spectra Brightness Meter at the scene. The brightness levels and patterns in large and even complex areas can be obtained in a fraction of a minute by this photographic means. The total time required is that needed to focus the camera, expose the film and measure the brightness level of two or more areas in the scene.

The three-plate camera is one designed for and used in early color photography. It is equipped with a Dogmar, 8¼-inch f4.5 lens. The lens provides a uniform field and no correcting filter is needed. The light is divided in the camera by an arrangement of partially silvered mirrors. The camera was modified for brightness recording by removing the color filters at each plate and installing neutral density filters.

Because of the design of the camera, one of the three plates receives reduced illumination. This plate was equipped with two neutral density filters, each of about 8 per cent transmission. Only one of

TABLE I.

Plate	Camera Without Filters Transmission	Transmission With Filters	Ratio of Brightnesses Recording Same Density on Plates With Simultaneous Exposure	
1	80%	.21%	500 to	100 to
2	100%	7.95%	12.5 to	2.5 to
3	100%	100.00% (no filter)	1	.2

A paper presented at the National Technical Conference of the Illuminating Engineering Society, August 17-22, 1958, Toronto, Ont.
Author: Pittsburgh Plate Glass Co., Glass Division Research Laboratory, Creighton, Pa.

Figure 1. Stenographic area studied.

Figure 2. Library area studied.

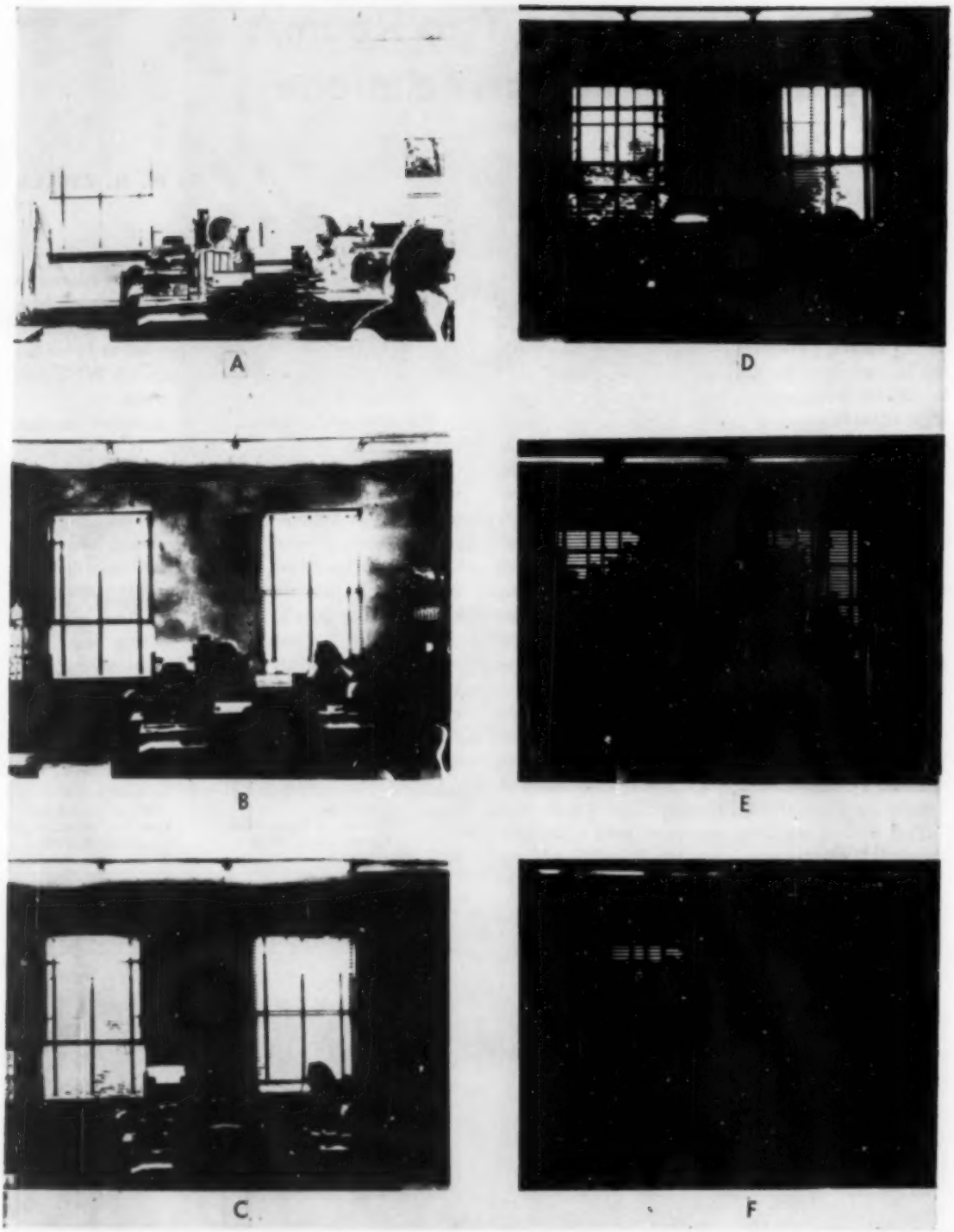


Figure 3. Brightness contours recorded for the stenographic area. The values of the contours in the photographs are 5, 25, 40, 200, 400 and 1700 footlamberts for Figs. 3A to 3F, respectively.

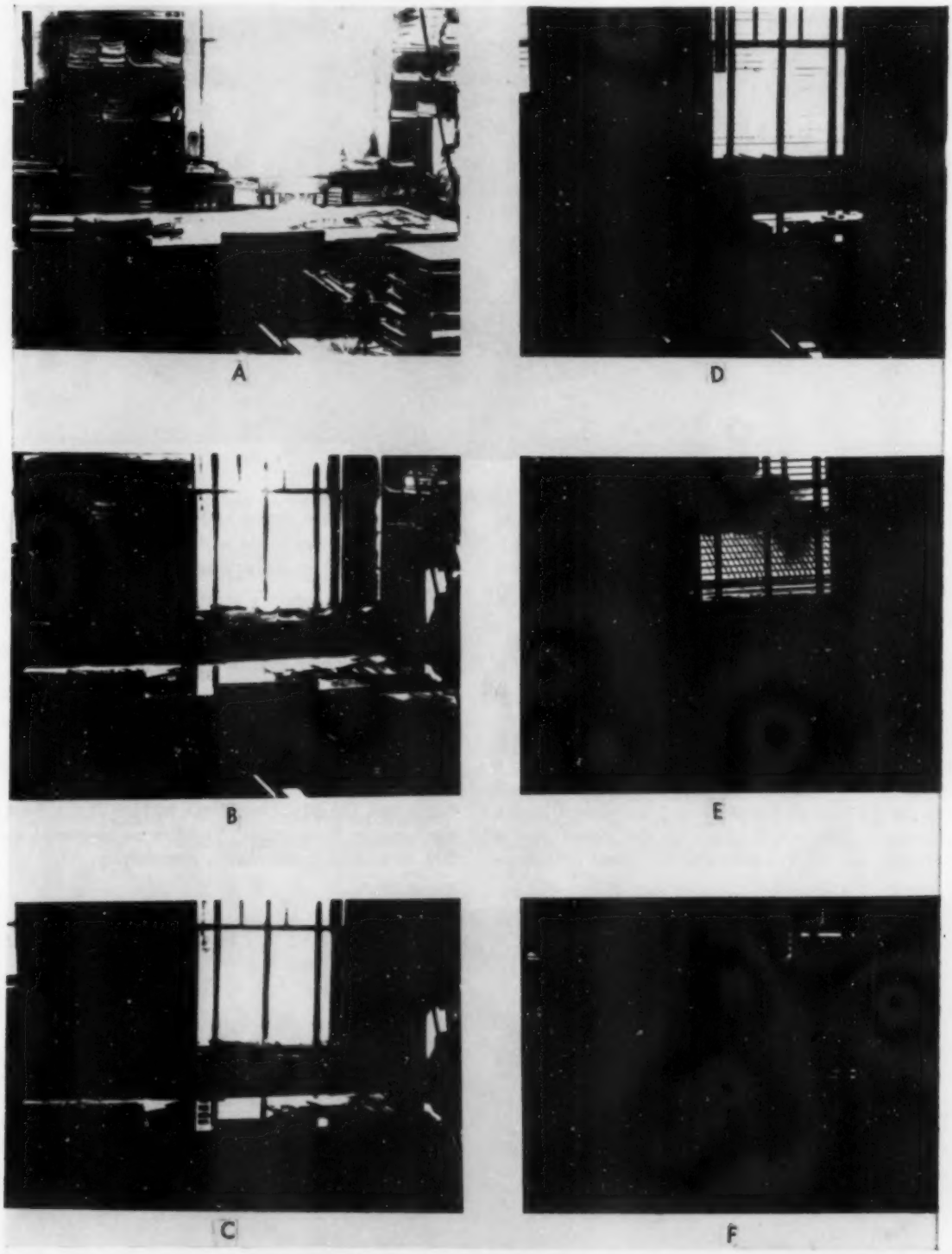


Figure 4. Brightness contours recorded for the library area. The values of the contours in the photographs are 5, 25, 40, 200, 400 and 1700 footlamberts for Figs. 4A to 4F, respectively.

Figure 5. Brightness contours shown in Figs. 3A to 3F sketched on a normal print of the stenographic area.

these filters was installed in the second plate, while the third plate was left without one. With this arrangement, a range of exposures can be obtained with a relationship between the plates as shown in Table I.

In order to calibrate the brightness contours obtained in the photographs, areas of known brightness are included in the scene. A Spectra Brightness Meter is used to measure these areas immediately before or while the photograph is being taken.

To evaluate the field use of this technique, a brightness survey was made of areas in two rooms at the Pittsburgh Plate Glass Co., Glass Division Research Laboratory. One of the rooms was a library, the other a stenographic area. The areas photographed are shown in Figs. 1 and 2.

The survey was made without interrupting the routine of work or disturbing the occupants in the rooms.

The camera was equipped with type B, Panchromatic film, which has a color response close to that of the human eye. A time exposure of thirty seconds was used with a lens opening of f16.

The results obtained in the study are shown in the photographs, Fig. 3A-F. To illustrate the use of calibration standards, those used in the stenographic area, Fig. 1, are the lamp on the desk, the paper and the adjoining wood surface of the desk shelf in the foreground. These were measured at 200, 40 and 25 footlamberts, respectively.

Figure 6. Brightness contours shown in Figs. 4A to 4F sketched on a normal print of the library area.

Figure 7. Multiple exposure print of brightness contours recorded for the stenographic area. Here the several contours were printed in register on the same piece of paper.

The brightness levels and patterns obtained can be reported in several ways. One is to present the results in a series of photographs of the various contours as shown in Figs. 3A-F and 4A-F. Each of these photographs shows a contour of brightness in the scene. They were made by photographic processing to extreme contrast to produce black and white photographs without gray areas. The values shown are given in footlamberts. The white areas are brighter than the value shown, the black areas less than this value and the demarcation between black and white shows every point in the scene at that value.

Another method of reporting the results is shown in Figs. 5 and 6. Both are normal photographs of the scenes and the brightness contours obtained in Figs. 3A-F and 4A-F are drawn on the photographs by hand.

A third method of presenting the results is shown by Figs. 7 and 8. In these, the several contours were reproduced photographically on one print. These were obtained by exposing high contrast paper to light through each of the negatives of the various contours before developing.

The technique appears to be a useful tool both in daylighting and manufactured lighting surveys. Note the several contours at and around the ceiling and desk lighting fixtures in Figs. 5 and 7.

Specular reflections can be measured as illustrated by the reflections from the glass table top in

Figure 8. Multiple exposure print of brightness contours recorded for the library area. Here the several contours were printed in register on the same piece of paper.

Fig. 6 and the bright metal components of the typewriter in Fig. 8.

Considering the variability of the outdoor illumination, the variety of objects, specularly reflecting surfaces and wide range of brightnesses present in the scenes, the many measurements obtained could have been made by no other way in so short a time and with so little equipment.

The author is grateful to Professor and Mrs. Marsh for the measurements made in the survey and the advice and assistance given in the preparation of this paper.

Reference

1. Marsh, C. and E.: "A Photographic Method of Brightness Recording," ILLUMINATING ENGINEERING, Vol. LIII, No. 6, p. 355 (June 1958).

Signs at Southdale Shopping Center

Three stores, facing on an interior court at Southdale Shopping Center, Minn., have one thing in common — backlighted Plexiglas identification signs.

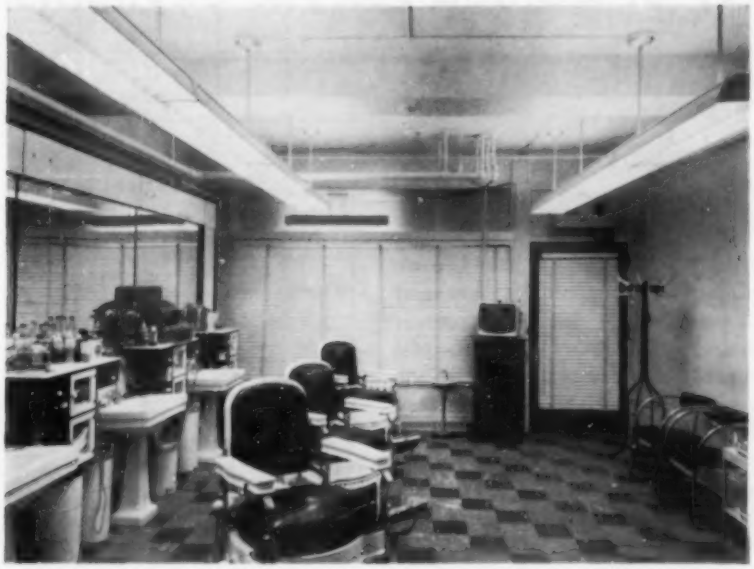
Flagg shoe store. Here the sign is placed in the door of a display, which can be opened for easy maintenance. The sign is 3 by 4 feet. The words "Flagg" and "Hardy" are ¼-inch thick, black plastic on a white background. The word "Douglas" is mounted on a yellow panel and the design at the right is green and white. Ten F30T8WW lamps are installed behind the sign.

Richman Brothers clothing store. A large strip sign, 10 inches deep, 30 inches high and 13 feet long, is composed of ⅛-inch thick flat red acrylic letters mounted on a corrugated acrylic background. Frequency of the vertical corrugations is about one inch. Four rows of 48-inch rapid-start fluorescent lamps behind the sign are each 12 feet long.

Bachman's florist shop. Free-form sign is 10 inches deep, approximately 8 feet long and 3½ feet high. Wooden script letters, 2¼ inches deep, are mounted on a ¼-inch thick white acrylic background. Four 72-inch T12 slimline lamps on 430 ma are mounted behind the diffusing panel.

Photos and data courtesy of Louis J. Riegert, B. M. D. and R., Inc., Minneapolis, Minn.

A.I.A. File No. 31



INSTALLATION AT MILLIE'S BARBER SHOP, 844 HIGH STREET, POTTSTOWN, PA.

Lighting a Barber Shop

LIGHTING OBJECTIVE: To provide a high level of illumination for haircutting and general illumination for reading in the waiting area.

GENERAL INFORMATION: This 20-foot 5-inch x 15-foot 3-inch x 10-foot 2-inch shop has light green (68% RF) walls and ceiling, white (77% RF) metal venetian blinds and gray (28% RF and 8% RF) asphalt tile flooring.

INSTALLATION: Two rows of two-lamp Day-Brite Lighting Inc. catalog No. 46457 luminaires, with 40-watt T-12 deluxe warm white rapid start fluorescent lamps, are mounted on 24-inch stem hangers. The rows are 8 feet apart, with four luminaires located over the barber chairs and three in the waiting area. The average illumination after 300 hours operation at customer head locations was 65 footcandles with the following brightnesses:

Ceiling		Luminaire	
above luminaire	44 fL	20 degrees crosswise	271 fL
between luminaires	34 fL	35 degrees crosswise	632 fL
Walls	20 fL	45 degrees crosswise	1580 fL
Blinds	23 fL	20 degrees lengthwise	316 fL
Floor		30 degrees lengthwise	542 fL
28% RF tile	13 fL	45 degrees lengthwise	1620 fL
8% RF tile	4 fL		

Lighting designed by George C. Linthicum, Philadelphia Electric Co.; installed by Len Fritz, Pottstown, Pa.

Lighting data submitted by George T. Anderson, Jr., Philadelphia Electric Co., as an illustration of good lighting practice and to aid in the design of similar installations.

Published by the Committee on Publications of the Illuminating Engineering Society, 1860 Broadway, New York 23, N. Y.

A.I.A. File No. 31

Efficiency of Domed Acrylic Skylights

By EDWARD LINFORTH

SINCE THEIR introduction ten years ago, dome-shaped acrylic plastic skylights have become established as an efficient and economical means of top-lighting, both as sole and supplementary sources in school buildings, residences and commercial structures, wherever ceilings can be opened to the sky. They are now offered to the building industry by more than a dozen manufacturers and are available in many types and sizes. Paradoxically, however, adequate data for dome skylighting design and prediction calculations have been entirely lacking. As a result, lighting engineers have been forced to resort to assumptions regarding dome transmittances and well interflectance effects now known to be erroneous.

A test program to obtain design data for skylights formed from white translucent acrylic sheets was undertaken at Bristol, Pa. Transparent colorless and tinted domes are sometimes used for decorative daylighting or where "picture windows" in the roof are desired. Translucent domes which provide diffuse distribution of direct sunlight, however, are normally specified for functional lighting.

The following significant dome characteristics were evaluated:

(1) Daylight transmittance,
(2) Distribution,
(3) Surface brightness,
(4) Net efficiencies with wells and ceiling diffusers,
(5) Total solar energy transmittance.

Skylight dome and ceiling diffusers made of three representative densities of white translucent acrylic sheet were tested. All domes were square in plan and formed from $^3/_{16}$ inch thick sheet to a height equal to 25 per cent of the length of one side. All ceiling diffusers were $\frac{1}{8}$ inch thick flat panels. The designations used in this paper of the three densities of acrylic sheet and the luminous transmittance of the two thicknesses of each as determined by Hardy type spectrophotometer for CIE Illuminant C are:

W-7328, thickness $\frac{1}{8}$ inch — 0.33; thickness $^3/_{16}$ inch — 0.23
W-2447, thickness $\frac{1}{8}$ inch — .56; thickness $^3/_{16}$ inch — .44
W-2067, thickness $\frac{1}{8}$ inch — .73; thickness $^3/_{16}$ inch — .61

A paper presented at the National Technical Conference of the Illuminating Engineering Society, August 17-22, 1958, Toronto, Ont.
AUTHOR: Rohm & Haas Co., Philadelphia, Pa.

Daylight Transmittance

Transmittance measurements were made with an integrating sphere approximately 6 feet in diameter, under natural outdoor conditions. There was a single opening in the sphere, 1.5 feet square, equal to 2.2 per cent of the sphere area. A color- and cosine-corrected photo-cell was used in the sphere. A similar photo-cell was mounted outside in the plane of the horizon as a control. Each cell was connected to a $\frac{1}{2}$ per cent microammeter to permit concurrent readings.

Measurements were made under conditions of clear sky and direct sunlight and under solidly overcast sky. Data reported are averages of observations repeated from time to time over a period of several months. Variations in results under similar conditions did not exceed 5 per cent. Transmittances in relation to the elevation of the sun in clear sky are presented graphically in Fig. 1. Comparable transmittances under overcast sky conditions will be found on the first line of Table II. (Well Index, 0.0; Diffuser Type, None.)

Distribution

Distribution measurements were made in the Daylight Laboratory's rotatable building. All interior surfaces were painted matte black. A square opening was made in the horizontal roof over which the domes were placed. Measurements were made at constant radius and 10-degree increments in the vertical plane containing the sun, and in a vertical plane at an angle of 90 degrees thereto. A control photo-cell to measure illumination on the plane of the roof was used as before. Distribution in the plane of the sun, the most adverse condition, is shown in Fig. 2.

Surface Brightness

Surface brightness measurements were made in the daylight study building with the domes installed in the roof as for the distribution measure-

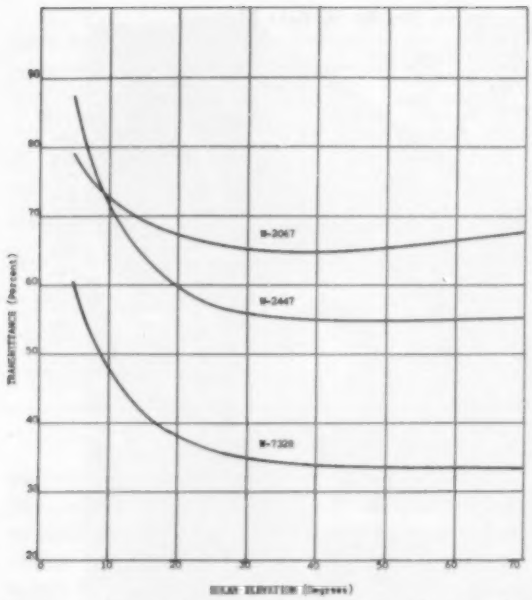


Figure 1. Transmittance of direct sun and clear sky light by W-series acrylic skylight domes vs. solar elevation. Top to bottom: W-2067, W-2447, W-7328.

ments. A Spectra Brightness Spot Meter was used. Tests were conducted under conditions of clear sky and solar elevation of 43 to 45 degrees providing a mean horizontal illumination of 8800 footcandles. Observations were made in the vertical plane containing the sun and at three viewing angles: (1) looking directly toward the sun, (2) at an equal but opposite vertical angle away from the sun, and (3) directly upward toward the zenith. The results are contained in Table I.

Net Efficiencies

In actual use, domes are necessarily installed above skylight wells of a depth determined by the roof structure and curb height. In addition, diffusing panels mounted in the plane of the ceiling may be employed to improve lighting quality. Hence, the overall efficiency of the skylight "fixture" comprising dome, well and sometimes diffuser, is of primary practical significance.

Net efficiency factors for various combinations of domes, wells and diffusers are given in Table II. They were obtained with the integrating sphere described above under solidly overcast sky conditions.

Transmittance measurements were made of each of the combinations noted in relation to wells of 0.0, 0.5 and 1.5 indices. Values for intermediate indices were obtained by graphical interpolation.

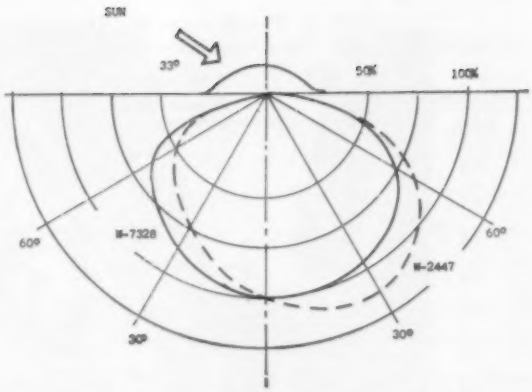


Figure 2. Distribution of W-series acrylic skylight domes in the vertical plane containing the sun shown as per cent of the vertical component (0 degrees).

Total Solar Energy Transmittance

Extensive tests of direct and diffuse total solar radiation transmittance of acrylic domes were conducted employing solar calorimeters designed in consultation with the Research Laboratories of the American Society of Heating and Air Conditioning Engineers. Details of procedures and results do not properly belong in this paper and will be reported elsewhere. In summary, the combined direct and diffuse transmittances of domes made of W series acrylic sheet were found to be essentially the same as the luminous transmittance values, as might be assumed on the basis of the formulation of these materials. The values obtained for domes made of other than W series material included in the tests indicate less favorable ratios of luminous to total solar energy transmittance than 1 to 1. Hence, luminous transmittance values for W series domes only may properly be employed in heat gain calculations.

Discussion

The W series of acrylic skylights encompasses a wide range of daylighting characteristics. The overall efficiency factors in Table II in conjunction with the brightness and distribution data provide a guide to the selection of type in relation to wells and ceiling diffusers to meet specific requirements imposed by use of the space, architectural considerations and availability of daylight at the site.

TABLE I — Dome Surface Brightnesses. (Clear sky; solar elevation — 44 degrees; E_h = 8800 footcandles).

	Brightness (Footlamberts)			
Dome Type	Side Toward Sun	Top of Dome	Side Away from Sun	Variation Max./Min.
W-2447	9500	7800	5100	1.9
W-7328	4600	4200	3500	1.3

TABLE II — Overcast Sky Transmittance Factors for Acrylic Skylight Fixtures.

Well Characteristics		Skylight Dome Type								
		W-7328 Diffuser Type			W-2447 Diffuser Type			W-2067 Diffuser Type		
Index	Reflectance	None	W-2447	W-7328	None	W-2447	W-7328	None	W-2447	W-7328
0.0	—	.35	.260	.198	.570	.408	.279	.691	.466	.320
0.1	.80	.320	.244	.175	.530	.370	.248	.630	.428	.294
	.50	.300	.224	.140	.494	.335	.225	.614	.396	.275
0.2	.80	.290	.219	.158	.485	.340	.223	.578	.395	.270
	.50	.264	.187	.112	.432	.284	.190	.545	.342	.236
0.3	.80	.266	.195	.145	.450	.313	.203	.533	.364	.248
	.50	.232	.158	.092	.380	.242	.165	.487	.302	.205
0.4	.80	.246	.180	.134	.415	.289	.188	.495	.339	.230
	.50	.206	.147	—	.340	.212	.143	.439	.270	.182
0.5	.80	.233	.166	.123	.396	.268	.173	.468	.316	.215
	.50	.183	.122	—	.304	.188	.125	.396	.244	.162
1.0	.80	.163	.117	.087	.270	.183	.123	.336	.222	.152
	.50	.104	.067	—	.174	.107	.071	.233	.146	.097
1.5	.80	.119	.086	—	.195	.129	.880	.248	.158	.110
	.50	.061	—	—	.102	.060	—	.137	.087	—

W-7328 domes are characterized by low brightness, low transmittance and excellent diffusion. W-2067 domes, in contrast, provide high transmittance, high brightness and significantly less diffuse distribution. W-2447 domes combine relatively high transmittance with good distribution and brightness between the other two types. It is apparent that the choice, as in electric lighting, lies between large area sources of low brightness and small area sources of high brightness. The latter may be quite satisfactory for lighting areas where simply enough light is the objective. When quality of visual environment is of primary concern, large area low-brightness sources are recognized as essential.

Consideration of the brightness and distribution data relating to W-7328 and W-2447 domes will quickly reveal the value of ceiling diffuser panels as a means of improving quality of lighting by reducing brightness contrast ratios. Diffusion of direct light by the dome and interflectance between dome, well surfaces and ceiling diffuser results in uniform brightness of the diffuser.

It should be noted that the contrast ratios between task brightness and diffuser brightness depend entirely upon room proportion and reflectances and diffuser area in relation to total ceiling area, and are quite independent of the transmittance of skylight fixtures or outdoor illumination.

Mercury in a Bank

General illumination in Van Nuys Savings and Loan Co., Panorama City, Calif., is from 34 walls urns, each with an improved-color 400-watt mercury lamp. Ballasts are remotely located to avoid noise.

The lower floor, under the mezzanine, is lighted with fluorescent lamps on 18-inch centers over a hexagonal-celled diffuser. Footcandles range from 45 in the customer area to a maximum of 115 in the office area. On the mezzanine, the range is from 85 to 160 footcandles.

Photo and data courtesy of Dept. of Water and Power, City of Los Angeles.

A.I.A. File No. 31

INSTALLATION AT DURA DIVISION, DETROIT HARVESTER CO., TOLEDO, OHIO.

Lighting for Chrome Inspection

LIGHTING OBJECTIVE: To provide high-level lighting from a large-area low-brightness source for inspection of chrome-plated parts.

GENERAL INFORMATION: The chrome parts are carried through the inspection area on the plating racks by means of a suspended conveyor system. The inspectors shown above are looking for rough spots, discolored areas and incomplete plating.

INSTALLATION: Smithcraft Arealiter Catalog No. 10496 totally enclosed luminaires with plastic diffusing panels are suspended eight feet above the floor, in continuous rows 32 feet long, on each side of the conveyor line. Each two-foot wide unit is equipped with four 96-inch T-12 daylight slimline fluorescent lamps. A plywood "curtain" was installed at the rear of the inspection area to screen the brightness of the windows opposite. Illumination on the work after three months operation varied from 110 footcandles at the top to 80 footcandles at the bottom. Luminaire brightnesses with new lamps are: 45 degrees crosswise, 660 fL, and lengthwise, 615 fL; 30 degrees crosswise, 615 fL, and lengthwise, 615 fL.

Lighting designed by Robert McArthur, Plant Engineer, Dura Division, Detroit Harvester Co., Toledo, Ohio.

Lighting data submitted by John B. Cloer, Power Representative, Toledo Edison Co., Toledo, Ohio, as an illustration of good lighting practice and to aid in the design of similar installations.

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Series XXIII

A.I.A. File No. 31

Academically Speaking . . .

College or high-school activities present a variety of seeing tasks other than those in classrooms—from poring over fine print in a medical library to seeing who's ahead in the churning water of a pool during a swimming race. School auditoriums, in themselves, require flexible lighting for their many uses; and the required levels vary with the purpose to which the football team's training room is put. These "other areas" shown here were all entries in Section or Chapter contests for My Most Interesting Lighting Job.

University of Pittsburgh Library and Lounge

Part of an extensive construction program at the University of Pittsburgh is the newly-completed School of Health Professions building. The school has the latest in medical teaching facilities including the Maurice and Laura Falk Medical Library, which occupies two floors. A student lounge area is also located in the building, just inside the main entrance. Similar lighting treatment was given to library and lounge.

The entire building is designed on a modular pattern, with most of the columns on 16- and 18-foot centers. Floor-to-floor spacing is 11 feet. Column spacing permits the use of 18-inch beams in all ceilings, with maximum headroom and floor space per cubic foot of building.

The architect requested that the lighting system should fit into the ceiling beam pattern and not protrude into the room. Therefore modular vinyl panels were designed with perimeter frames of the same material as the acoustic fins. These are recessed between the corrugated metal ceiling strips, concealing pipes and air conditioning ducts.

Since the recesses in the ceiling are not of uniform size, the plastic panels fitting into them had to be carefully designed so the acoustic wedges would line up, forming continuous lines. In the

Similar lighting treatment was given to the library and lounge.

lounge area, for example, the 85 panels are of 14 different widths.

Lamps hug the top of the 12-inch deep all-white cavity above the plastic. Lamp spacing is on 12- to 16-inch centers.

Average maintained illumination in the library is 90 to 110 footcandles, and in the lounge 40 to 60. Maximum brightness ratio anywhere in the field of view is 10:1. All finishes are light.

One major obstacle faced was a local fire code ruling barring the use of vinyl sheets in "public gathering places." Vinyl is rated as "self-extinguishing," does not produce a toxic hazard, and due to its low heat distortion temperature, it is approved for use under sprinkler heads. The Pittsburgh Fire Department, however, feared that the plastic, melting at 140F and falling from the ceiling might produce a panic hazard. Many conferences were held with city officials, and permission was finally granted, to use the system as designed with retainer rods on two-foot centers. These rods fit into the plastic corrugations and would prevent the sheets from falling to the floor in case of fire.

This installation was the entry of Donald C. Thomas, Sylvania Electric Products Inc., in the Pittsburgh Section's contest for MMILJ, where it won first prize. It placed second at the East Central Regional. Recognition is also given to Dan Schmidt of Sylvania, who was salesman on the job during construction. Electrical contractors: H. B. Foley Co. and Patterson & Comstock, both of Pittsburgh, Pa.

Supplementary lighting from adjustable hanger spotlights supplies 400 footcandles for inspection of deep cuts and bruises.

Georgia Tech Training Room

The football team's training room at the Georgia Institute of Technology is located under the reinforced concrete stadium. Roof and ceiling of the room slant with the stadium above, from 13 feet on the high side to 6 feet 6 inches on the other. The room is 17 feet wide, 58 feet 6 inches long.

The training room is used as a first-aid station for determining the extent of an injury and administering treatment. White pegboard walls above the gold plastic wallpaper are hung with the coaches' favorite pictures. Floor is a light tan ceramic tile and the ceiling is white acoustic tile.

Roof and ceiling structure consist of a culvert tile and corrugated metal roof, insulation, and a wood frame for support of the white acoustic ceiling. This structure created a problem in recessing the lighting equipment. Cost was also a factor and the college officials wished that all work be done by their own shops.

It was decided to take advantage of the diffuse surfaces and sloping ceiling and use an indirect lighting system for general illumination. Windows on the high wall were painted on the outside and the wall continued to the ceiling. A cove was constructed 8 feet 2 inches from the floor at a point just below the original window line. The 27-inch wide cove, which contains two continuous rows of 110-watt high-output lamps, was built and installed by the Georgia Tech shops. The inside of the cove was painted with high gloss white enamel and the outside was painted to match the wall.

Illumination readings across the room, taken seven months after installation, were 28 footcandles on the pictures under the cove, 38 at a point six feet out from the cove wall and 25 footcandles against the opposite wall. This was true throughout the length of the room except at end walls where the reading was 25 footcandles. Brightness reading, sighting just above the lip of the cove at the surface of the column nearest the light strip, was 375 footlamberts, and sighting at the wall behind the cove just above the lip of the cove was 225 footlamberts.

Supplementary lighting from adjustable hanger spotlights supplies 400 footcandles for inspection of deep cuts and bruises.

Installation was designed by Saylors J. Andre, Georgia Power Co., Atlanta. It won first prize in the Georgia Section's contest for My Most Interesting Lighting Job and placed third in the contest at the Southeastern Regional.

Colgate University Swimming Pool

Four requirements were set forth for the lighting system at the Colgate University swimming pool. These were:

(1) Plenty of light, evenly distributed over the pool and surrounding areas;

(2) Protection against humidity and sturdiness to withstand rough treatment;

(3) Minimum maintenance;

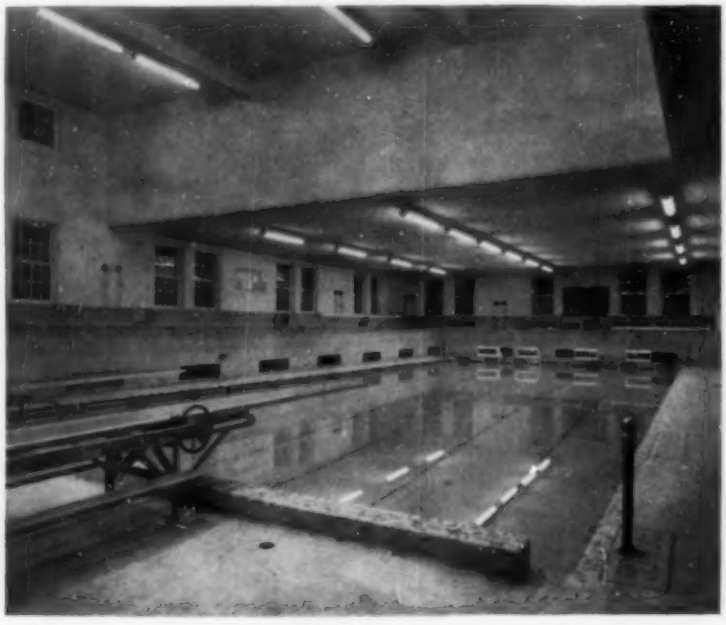
(4) Entirely overhead installation with no underwater lighting.

Ceiling height over most of the pool area is 13 feet above the water, but at the deep end, where the two diving boards are located, it is 23 feet. Along one side of the pool is a spectators' section where the top row of seats is close enough to the ceiling so that eye level of a spectator will be very close to the lighting. Pool walls are tan tile and the walls of the room are painted a medium tan.

Originally the 40- by 75-foot pool was lighted by 24 incandescent globe fixtures, each using 150-watt lamps. These were deemed unsatisfactory for lighting level, distribution and glare. Also, they could not withstand the rough usage of water polo, a popular sport at Colgate.

Maintenance problems and temperature and humidity conditions influenced the decision as to type of lamp and fixture for the re-lighting installation. The longer life of fluorescent lamps recommended their use. A constant 80-degree high-humidity climate in the pool room dictated the use of weather-proof, sealed, outdoor luminaires.

The fixture chosen has an extruded aluminum housing and clear ribbed acrylic cover mounted in an extruded aluminum frame-hinged door, held in



When pool is in use, the churning water does not show reflections of the luminaires.

place by spring-loaded catches. Neoprene gaskets seal the door. A removable polished Alzak reflector provides effective distribution with 1400 candlepower extending 50 degrees from normal on each side of the lamp axis. Each fixture uses two rapid-start F72T12 lamps, operated by 1000 ma high power factor ballast.

The final layout provides 30 footcandles in the diving area and 20 over the remainder of the pool. Units on the edge of the pool are angled in 15 degrees to provide maximum use of beam lumens. When the pool is in use, the churning water does not show the reflections of the luminaires, visible in the accompanying cut.

As a final touch to the relighting job, the walls were repainted a light blue.

This installation was the entry of Donald R. Brown, Crouse-Hinds Co., Syracuse, N. Y. in the Central New York Section's My Most Interesting Lighting Job Contest.

Due to the simplicity of this structure, all decorative effects must be derived from the lighting.

Eau Claire High School Auditorium

Flexibility was a key word in prescribing the lighting system for the auditorium of the Eau Claire Senior High School. Low levels are needed for theatrical purposes, but high levels are required when the auditorium is used for lecture note-taking. Also, due to the simplicity of the structure, all decorative effect must be derived from the lighting. And maintenance costs must be low.

The auditorium is 128 feet long, 96 feet wide; ceiling height is 20 feet at the rear and 26½ feet in front of the stage. Finished with cement block, the walls are painted a light cream color. Ceiling is of acoustic plaster painted white.

Continuous coves down each side of the room, mounted just above door level, were selected, with 112 150-watt R40 lamps used in each. Coves are 15 inches wide and 7½ inches deep. Lamps are wired on eight circuits on each side, each circuit using 1 yellow, 1 pink, 1 light blue, 1 dark blue and 4 white lamps. Any combination of circuits may be switched over to the dimmer control which is located back-stage.

Illumination level at the center of the auditorium is 35 footcandles under maximum lighting. By using only the dark blue lamps, levels may be dimmed to any minimum value desired. Colored light reflected from the neutral surfaces provides decorative treatment which can be varied and controlled. Maintenance is from a step ladder and can be done by unskilled labor.

Entered by Paul Talbot, Garden City Plating & Manufacturing Co., Minneapolis, Minn., this installation won second prize in the Twin City Section's MMILJ contest. Chief engineer for the job was Kenneth W. Wilson, E. F. Klingler & Associates, architects and engineers, Eau Claire, Wis.

Floodlighting Niagara Falls

By W. A. DALRYMPLE
C. A. ALBINI

NIAGARA FALLS have been internationally renowned for many years, as one of the great spectacles of nature. For those who are not acquainted with them, perhaps some statistical information on the Falls themselves would be of interest.

Falls on the Niagara River take in a total width of approximately one mile. They are divided into the American Falls and the Canadian, or Horse Shoe Falls, by Goat Island which is situated in the middle of the river. Falls drop into a deep gorge with a 162-foot drop on the Canadian Falls and 167-foot on the American Falls. There are approximately 38 million gallons of water per minute flowing over the Falls. This is reduced by about half during the night, when the Falls are not being viewed, in order to fill up reservoirs used in the Hydro Electric Power developments.

That this great spectacle should be illuminated for night-time visitors was long an obvious need, and in 1926 the first floodlighting of Niagara Falls was installed. In June 1955 it was decided that the lighting on Niagara Falls was becoming obsolete and should be replaced, not only because of the obsolescence of the equipment, but also because higher intensities were required to bring the installation up to today's standard. It took from June 1955 until the official opening on June 20th, 1958, to accomplish this task.

The purpose of this paper is to describe what went on in this three-year period to accomplish the lighting of this mighty waterfall, with approximately ten times more light on the face of the Falls than was previously available.

The Problem

Given a free hand, *i.e.*, unlimited power and adequate space, the lighting of a project such as this presents no more of a problem than many others. However, in this instance, certain terms of reference were laid down. These limitations and requirements were:

(1) An existing supply of 375 kw of d-c power was not to be exceeded. This was generated specially for the old floodlighting system using twenty-four 125-ampere, low intensity, carbon arc, 36-inch diameter searchlights with manual color change.

(2) Just sufficient space was available to accommodate these 24 units on a rotunda open to all the elements. Extremely heavy icing conditions were prevalent in winter, caused largely by spray from the Canadian Falls.

(3) The intensity of light had to be considerably higher than the previous intensity so that the modernized installation would be in keeping with the much higher levels of illumination common today in both interior and exterior lighting.

(4) The lighting, when installed, was to be used for two and one-half hours per night, 365 nights of the year. This means, of course, that the equipment has to be suitable for operating under both winter and summer conditions.

This was the challenge presented, and accepted, which took just one year and several thousand man-hours to meet. It was, as you will see from the detailed experimental work described later, at first exasperating, then fascinating as the more obvious solutions failed, leaving one final choice to work on and perfect.

This problem as presented by the joint Illumination Board of Niagara Falls, United States and Canada, was forwarded to the Research Laboratory in England. This is the way the problem was attacked and solved.

Topography

Before any work of an experimental nature could be started, consideration had to be given as to the most suitable position from which to project the light. There were two essential factors involved:

(1) An uninterrupted view of both Falls.

(2) No greater exposure to spray than previously experienced.

The only other possible location for projection of light was the Ontario Power Station roof almost directly below the rotunda. However, the heavy spray conditions experienced there ruled this out. Back scattering of light would have produced a veiling effect, making the viewing by spectators

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AUTHORS: Amalgamated Electric Corp., Toronto, Ont.

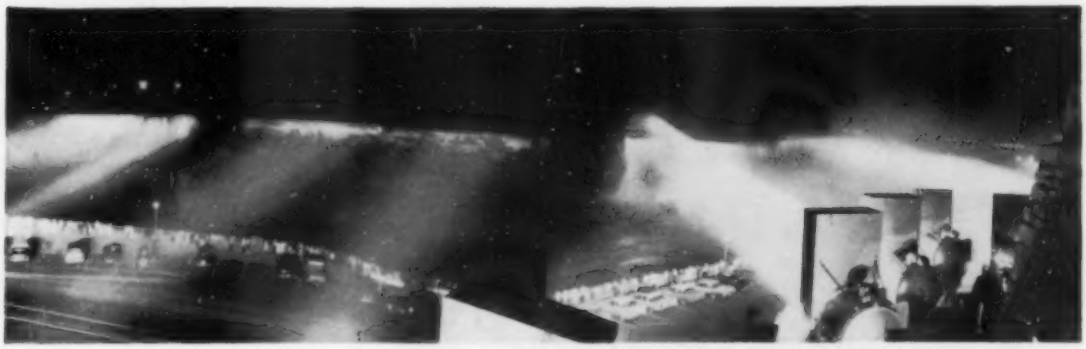

Figure 1. Complete panoramic view of the Falls with new floodlighting system.

directly behind the beams more difficult. Work, therefore, was scheduled to proceed using the existing location.

Light Sources Considered

Although low intensity carbon arcs were in use, it was felt that the wider range of light sources now available should be considered. The most obvious choice to start with was incandescent. However, wartime experimental work in Britain showed that to obtain the proper control of light from such a comparatively large area source, the reflector would have to be so large as to make the unit bulky beyond consideration.

The next choice was the improved-color mercury discharge lamp. The spectral distribution was unsuitable for the range of colors required and the source brightness was insufficient to obtain the necessary candlepower.

Hopes ran high with the investigation of the zenon compact source lamp. Brightness and color were right, but the fact that it required a starting pulse of several thousand volts and had a pressure of approximately 30 atmospheres when hot ruled it out, as the damp conditions obtaining on the site could adversely affect operation and, moreover, would represent a continuous hazard to the crew. This left one remaining source capable of producing the intensity required for long distance projection — the high intensity carbon arc. An advantage which it offers is suitable energy distribution for colors from blue to red. This, therefore, was the source chosen to project the light varying distances up to 3000 feet, the farthest point of the American Falls.

The searchlight chosen is of a type used in World War II which, when modified to suit the conditions, is reasonably economical to operate. It is a high intensity carbon arc rated at 150 amperes, and designed to burn at 75 volts from a 125-volt d-c supply. The 90-cm diameter mirror is parabolic in shape and has a focal length of 42 cm. The carbons are being manufactured in Canada; the trim consisting of a negative 14½ inches long with an axially rotating positive 22 inches long, both 16 mm in diameter.

The speed of the automatic motor drive, which maintains the carbons correctly at the focal point of the mirror, is determined by the voltage across the arc. With resistive losses in the control ballast, each unit takes a load of 18.75 kw. Thus a total of 20 such units would be used within the 375 kw of power available.

The body is cylindrical and is provided with access doors at the side for recarboning. Trunnion arms and baseplate allow for movement in vertical and horizontal planes, and a specially devised weatherproof conical cowl at the front connects to the color changing box to keep out snow and ice in the gap between the two units. A 6-inch diameter, one-quarter horsepower extractor fan is provided for fume dispersion and cooling.

The maximum intensity of each unit is 210 million candlepower, making a total of 4 billion 200 million candlepower available. When burning at the full load of 150 amperes, the carbons burn at the following rates:

Positive — 9¼ inches per hour, providing 1.78 burning hours.

Negative — 1¾ inches per hour, providing 5.1 burning hours.

Approximately 6 inches of each carbon length is wasted in the stub to keep heat away from the feed mechanism. With a program lasting two and one-half hours, these burning rates would necessitate re-carboning at least once during that period. If, however, the searchlights are set for 135 amperes, the positive carbon would last for the full two and one-half hours and the necessity for re-carboning would be avoided. A reduction in light output of only 12 per cent would result from the use of the lower current. The alternative was, of course, to

Figure 2. The floodlighting rotunda. The five units at right cover the American and Bridal Veil Falls.

use a longer positive carbon of some 36-inch length, but this would have made the unit so large that it would not fit in the space available on the deck.

Number of Projectors Required

With the limit to the number of units set at 20, their optical characteristics had to be worked out to cover the areas of the Falls. To determine the angular subtense of the Falls, a photograph was taken at the rotunda. By giving the optical characteristics of the camera and heights of known objects in the photographs to the people working on the project in England, who had never seen the Falls, a scale was derived. An angular web was superimposed by them on an enlargement of the photograph. This gave them the information they required which indicated angles of 13 degrees horizontally and 4 degrees vertically for the American Falls. The Canadian Falls subtend angles of 46 degrees horizontally and 7 degrees vertically at the extremities, with about 9 degrees in the center. The ratio of angular width being 3:1, it followed that 15 units would be required for the Canadian Horseshoe Falls and 5 for the American, using the conventional symmetric circular beam spread.

The beam divergence provided for minor adjustment so that the areas of water could be adequately covered. However, the designers did feel that, during an actual test on the site, some lenses which could be provided should be tried. A description of this is given later in this paper.

Color Media

With the old floodlights, manual color changing involved placing a wooden frame with sheets of colored cinemoid, a robust type of gelatin, in front of the beam. It was felt that in this age of "push-button" controls, something more mechanical would be in keeping with current trends. There were certain essential factors which had to be borne in mind when considering the merits of different media. These were: ability to withstand heat and maintain physical shape, color stability, economical life, ease and economy of replacements and weight.

Glass was the obvious choice. This meant that strips would have to be used to allow for unequal thermal expansion. The range of colors was limited and there was no guarantee that replacement strips would be identical. It was relatively costly, heavy and fragile. No real advantage could be found for it on this occasion.

Since plastic is the alternative to many problems where glass cannot be used, it was considered next. However, it soon became evident, after consultation with a leading manufacturer of plastics, that colors would fade in the presence of heat and the material would soften; hence this was ruled out.

Liquids — Consideration was given to either chemical solutions or colored oils, pumped into and out of glass tanks, with flushing solvents also pumped in and out after each color change to prepare for the next. The complicated hydraulics and uncertainty as to how colors would hold in the widely-varying ambient on the site, led to the shelving of this idea.

It had been said that the cinemoid in use at Niagara for many years had given satisfactory service. It had all the properties required except that when exposed to the weather it became crumpled. A simple means of joining sheets was devised as one sheet was not sufficiently large to cover the 3-foot square aperture. Further developments were put in hand based on the use of this color medium, preferably protected from weather.

The Electro-Mechanical Color Changer

Making the electro-mechanical device to effect color changing proved to be an arduous task, as models had to be made to ensure proper functioning over a period of time. A start was made with a form of concertina. Strips of various colors were hinged at each end, lying flat in a container, forward of and below the beam. These would be raised to the top and this action would unfold them into the beam. This device was rejected for three reasons. First, a fixed color program would result according to the predetermined sequence of colors. Second, there was the potential risk of failure of hinges along the edges of the strips. Third, replacing a faded or damaged strip within a composite strip proved difficult.

Next was considered a form of multiple signalling shutters, such as those used on naval signalling searchlights, in which a number of horizontal louvers, normally at right angles to the beam, can be made to rotate axially to allow light to pass through. By replacing the opaque louvers with strips of colored media, one could, at will, bring into use any set of colored strips to intercept the beam. The one great disadvantage was that these strips, in either position, were at all times in the main heat of the beam; sufficient reason to discard the idea.

Two devices, one employing concentric cylinders rotating on tracks around the searchlight, and, alternatively, a rotating disc similar to the color wheel used with theatrical spotlights, were eventually considered unsuitable for reasons of windage, bulk and inconvenience in gaining access to the searchlight.

The most promising of all the rotating devices was one based on a roller-blind or film-in-a-camera principle. Several sheets of different colored media cemented together would pass across the beam by unrolling from a spool at the top and being rolled onto a spool at the bottom. Cemented sheets held under heat tests on widely dissimilar colors which it was thought might cause appreciable differential expansion tending to spring the joints apart. An experimental model was constructed, but the prime difficulty was to obtain a variable speed drive to compensate for the varying diameters of top and bottom spools. Once again, a fixed-color sequence would be imposed and this was to be avoided at all costs.

The device which finally proved to be the most satisfactory, from the viewpoint of reliability, flexibility and accessibility, was one using metal frames with cross wires holding the media. These frames would slide vertically in guides similar to window

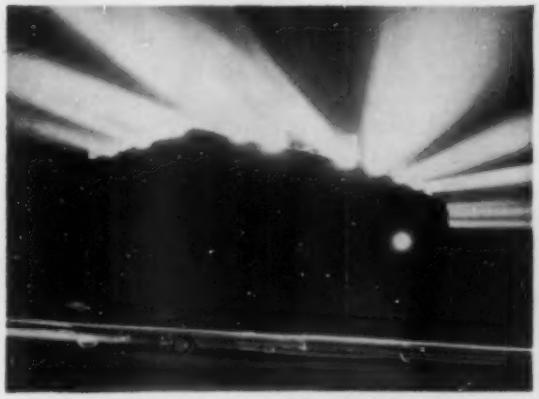

Figure 3. Nighttime view of the floodlighting rotunda showing the location of the various searchlights.

sashes. Five such frames, each individually actuated by a small geared-down motor, could be raised and lowered with counterweights and chain and sprocket to ensure smooth operation. Two-way and off switches control the motors to raise, lower or stop the frames at any intermediate point of travel. At the extremities of the guide rails, limit switches are fitted which automatically break contact when the frames ride over them. Five carefully selected colors, magenta, pink, amber, blue and green, when used singly, in pairs or three together, give a variation of 15 distinctly different colors.

To contain the color frames, motors and counterweight, a rectangular shaped housing about 7 feet 4 inches high by 4 feet wide and 2 feet deep is provided as a separate unit. It rests on a pair of arms protruding from the front of the searchlight and is rigidly anchored. The upper half stores the frames when not in use. The lower half coincides with the beam and is glazed in front. The color change housing can be detached, lowered onto a trolley, specially provided, and wheeled away for servicing as required.

A control panel is provided with 20 banks, each bank having five two-way and off switches. As each frame is independently switched, a never-ending galaxy of color variations can be provided, if desired. One master switch is provided so that a selection of colors can be pre-set, then, by pressing this switch, all are brought into play simultaneously. The same switch can be used to lift the color screens together and project white light from all units.

This seemed to be the ideal mechanism for this job, and an offer, to specially construct one unit, was made to the Illumination Board of the Niagara Parks Commission.

The group in England went ahead and just about the time the unit was completed, two mem-

bers of the Board were proceeding to England on vacation. A demonstration was set up for their benefit. A "miniature" Niagara Falls was devised using a white canvas screen in front of trees on a hill about 1700 feet from the unit. To simulate the effects of water foam, six powerful fire hoses were played on to it. Smoke bombs provided a screen of thick white smoke and the combination of these effects proved the results were as anticipated. However, it was the wish of the Board that the unit be tried on the site. It was shipped, in August 1957, to Canada and a description of the results follows.

As pointed out, the concentrated circular beam had been very accurately worked out so that the complete waterfall could be covered by the concentrated circular beam alone. It was recommended, by the Research Laboratory, that diffusing media should be tried out on the actual site in order to determine the best overall lighting result. The diffusing media used in this experiment with the demonstration unit at Niagara Falls were, first, a cathedral glass which gave a larger circular beam with a soft edge and second, a fluted glass which could change the beam pattern into ribbons of light which, depending on the application of the fluted glass, could be beamed at the Falls either at the horizontal or the vertical position. When the full effect of these spreader glasses was seen on the Falls themselves, the concept of making a panorama view of the whole Niagara Falls area was conceived, using these ribbons or bands of light in either the vertical or horizontal position to give a much more dramatic effect to the Falls and create a much greater difference in light pattern on the Falls from the old system. The panoramic effect of the Falls was created in the following method.

The American Falls has four horizontal bands of light stretching from side to side and covering the complete 167-foot height. Next came the small Bridal Veil Falls, which one circular beam with the cathedral glass covers adequately. Previous to this panoramic view, the rock face of Goat Island dividing the Canadian and American Falls was in relative darkness, detracting from the spectacle or completeness of the Falls by dividing them into two separate parts.

This panoramic concept, therefore, also required two horizontal bands of light running end-to-end across the rock face of Goat Island, joining together the two Falls and symbolizing the peaceful relationship between the United States and Canada. It also allows the whole great spectacle to be seen as an entity rather than in two separate parts.

The Canadian or Horseshoe Falls was lit with four horizontal beams on each of the left and right sides. This left the plume of spray in the middle of the Horseshoe Falls which was lit by two vertical beams emphasizing the great height that the spray rises from the bottom of the gorge.

One other aspect of the Falls which was never lit by the previous system was the turbulent rapids immediately above the Canadian Falls, which are really a spectacle in themselves. Three units with concentrated circular beams are now thrown on the upper rapids enabling them to be viewed, not only from the Canadian side, but also from the Goat Island park area accessible from the United States.

This layout not only provides the complete panorama view of the Falls in white light, but also now projects a very attractive color sequence on the Falls as each floodlight can project the particular color required; hence, four different colors can be projected on the horizontal bands across the American Falls. These colors, coming in front of the beam from the top of the color change unit described earlier, seem to flow from the river over the Falls, and the effect is extremely dramatic. This can be appreciated only by seeing the installation and is impossible to describe.

The size of the whole spectacle, along with the magnificent changing of colors on various parts of the Falls, has attracted many thousands of visitors who stand fascinated, watching the complete program of beautiful color flowing across these angry waters. Because of the greater intensity of light, they are now able to see the actual flowing of the water and its turbulence which was not possible with night-time viewing under the old system.

Know Your Officers

Photographs of IES National Officers and Council and of the Chairmen of Sections and Chapters for 1958-1959 are featured on pages 563 through 568, this issue. A listing of these officers, including company affiliation and address, begins on page 37A.

Striking Potentials of Long, Low-Pressure, Rare-Gas Electric Discharges With and Without Mercury

By ROBERT H. McFARLAND
RAIMO BAKIS

PREVIOUS work[1] discussed the striking potentials in similar discharge tubes in which the rare gas was argon. This paper extends that work using neon, argon, krypton and xenon, with and without mercury.

Apparatus and Method

Construction of the lamps used followed essentially the procedure described[1] previously. The major difference in this paper is that both the mercury and non-mercury lamps were attached to the same gas manifold, so that the rare gas was from the same gas flask in both lamps. Mercury was prevented from passing to the non-mercury lamp by liquid air traps.

Measurement of five different lamp voltages was determined feasible. These voltages, each measured across the lamp, were observed in the order listed as the voltage supplied to the tube was increased. They are defined as follows:

(1) E_1 is the rms voltage at which a brush discharge of a few microamperes between the movable, ungrounded electrode and the grounded water jacket first appeared.

(2) E_2 is the rms voltage at which a current of about five microamperes flowed between the two lamp electrodes. This is the first indication that the discharge current has, in its interaction with the grounded shield, extended as far as the grounded electrode.

(3) *GSV* is the rms glow striking voltage. This is the maximum lamp voltage reached prior to the appearance of a glow discharge carrying a current of two milliamperes between the two electrodes. This correlation of *GSV* with a constant current value was for convenience in measurement. Any other reasonable definition of *GSV* would make negligible differences in absolute values of *GSV*.

(4) *ASV* is the rms arc starting voltage. It is observed just prior to the drop in lamp voltage and increase in lamp current due to the onset of an arc discharge between the electrodes.

(5) *AOV* is the rms arc operating voltage measured with the lamp conducting four hundred milliamperes of current.

An oscilloscope displaying the current from the shield to ground was used to determine E_1 values. E_2 and *GSV* values were recorded when a small NE-2 indicator lamp placed near the lamp voltmeter was caused to be lighted. The lamp in turn was controlled by an amplifier whose control grid potential was determined by the potential across appropriate resistors in the grounded side of the lamp circuit. As the lamp voltage increased through the various stages, it was possible to manually switch progressively from the highest resistance needed to measure the microampere currents to zero resistance after the glow started. The value of 2×10^{-3} ampere current as a determinant of when the glow started was necessary as currents under this were unstable with some of the gases. Flashing was normally observed at lower currents.

The following procedure was used in making measurements. The arc was first operated for 10 minutes with a current of 0.4 ampere rms and an electrode separation of 80 centimeters. During this time, a spectrum of the positive column was taken with a Bausch and Lomb medium quartz spectrograph. The arc was turned off for a period of five minutes. After that, the arc was started once every minute, using a constant speed motor for turning the variac which increased the lamp voltage. At least five measurements were made at each of the following distances, in the order given: 80, 70, 60, 50, 40, 30, 20, 10, and 80 centimeters.

Usually the 80-cm measurements at the end of the run were observed to be slightly lower than at the beginning. E_1 was then measured at the 80-cm length and finally the *AOV*. A grounded and temperature controlled water jacket was used as in previous work.[1]

This paper is an adaptation of a thesis presented by Mr. Bakis as partial fulfillment of the requirements for the degree of Master of Science in Physics at Kansas State College. The work is supported by the Office of Ordnance Research, U. S. Army. AUTHORS: Department of Physics, Kansas State College, Manhattan, Kans.

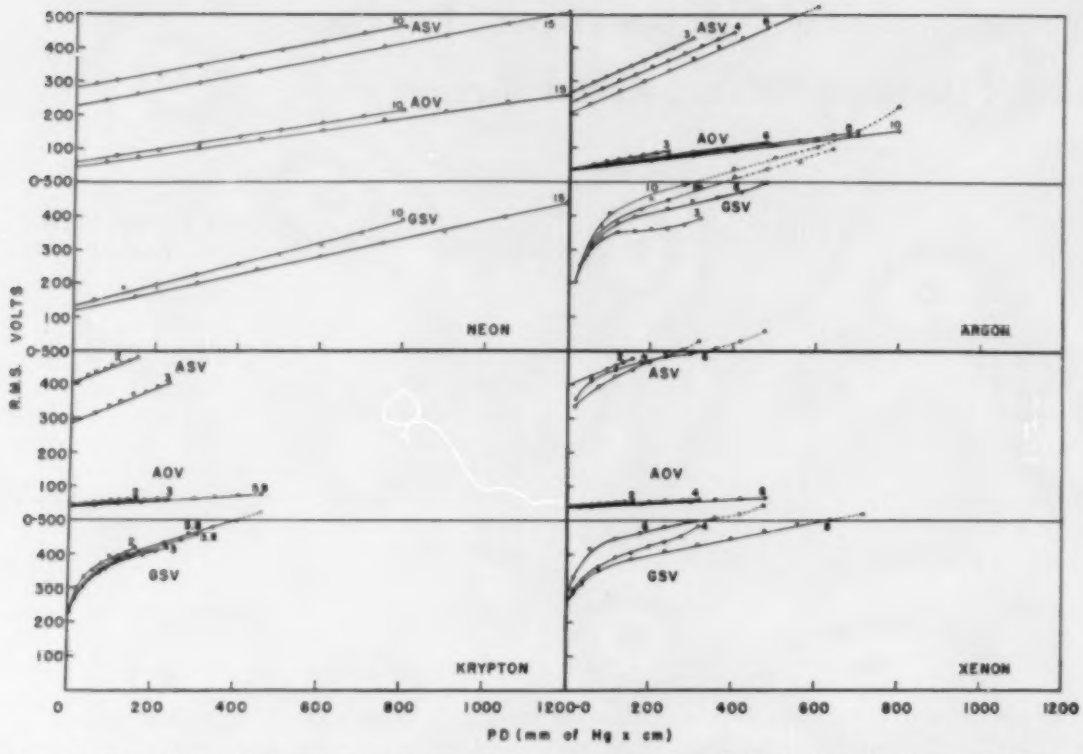

Figure 1. Arc and glow starting and arc operating potentials as functions of the product of pressure and distance (mm of Hg × cm) for constant pressures of rare gases.

Results

Figs. 1 and 2 show the results obtained for the mercury and mercury free lamps with neon, argon, krypton and xenon. Since the *AOV* includes the drop across the nichrome lead wire to the movable electrode, the approximate corrected *AOV* can be obtained for the mercury lamp by subtracting 0.4 ampere × 40 ohms = 16 volts, from each value of Fig. 1. A corresponding correction, 0.4 amp × 70 ohms = 28 volts, applies to the mercury-free lamp. Corrections for the other voltages measured were negligible due to the low currents involved.

Unfortunately, during the collection of the data shown in Figs. 1 and 2, it was not possible to obtain all the data desired. For example, the cathodes in the neon lamps are rapidly destroyed at pressures less than 6 mm Hg. The *ASV* values in higher pressures of xenon could not be adequately measured since they are equal to or lower than the *GSV* values and the arc immediately follows the glow. At all pressures the xenon *ASV* values are suspect; and at 8 mm Hg or above, the *ASV* cannot be measured or distinguished from the *GSV* values.

Fig. 3 was obtained by superimposing Figs. 1 and 2, less legends, on one another photographically. Unfortunately one must refer to Figs. 1 and 2 for identification and determination of whether mercury was present.

Table I presents the values of the current which immediately precede the initiation of the arc for various lengths and pressures of a mercury-argon discharge tube.

Table II lists comparable currents for a mercury filled lamp with gas pressures of 6 mm Hg. (Note: lamp used modified cathode structure and cannot be compared with argon results of Table I.)

The spectrum from the region near the cathode

TABLE I.

Distance Between Lamp Electrodes (cm)	Current Preceding Initiation of Arc (ma) Pressures 2mm Hg	4mm Hg	8mm Hg
80	44	31	26
70	44	31	26
60	43	31	26
50	43	31	26
40	43	30	26
30	43	31	27
20	43	31	26
10	43	30	26
5	43	30	26

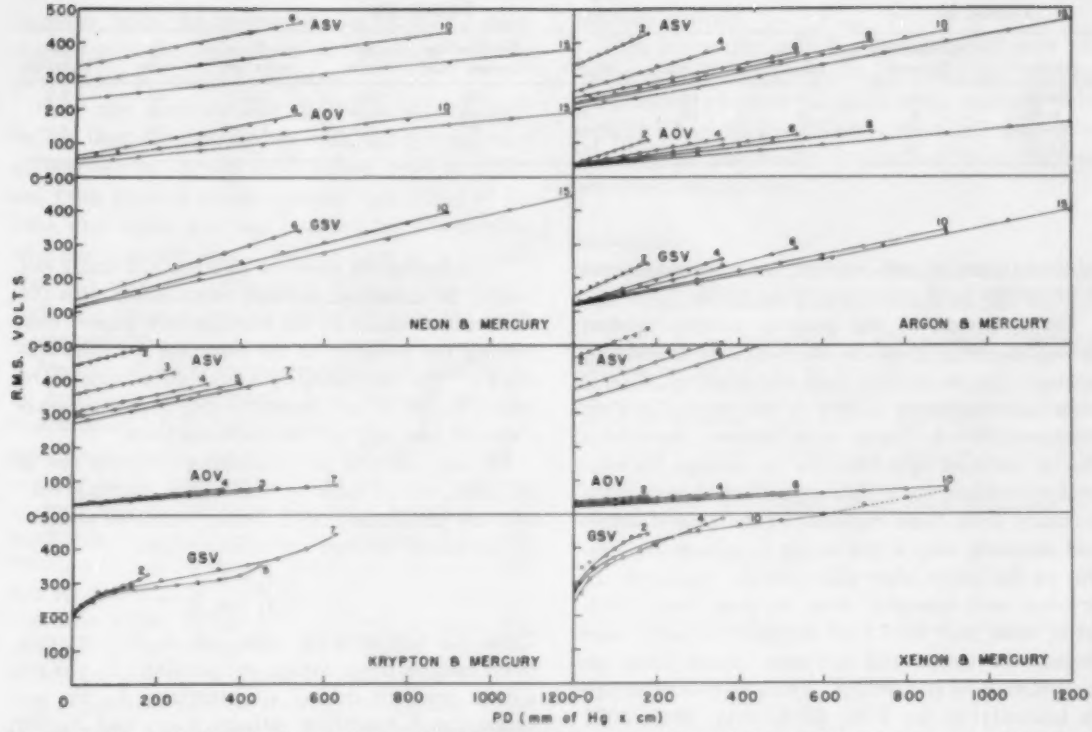

Figure 2. Arc and glow starting and arc operating potentials as functions of the product of pressure and distance (mm of Hg × cm) for constant pressures of rare gases with mercury vapor present.

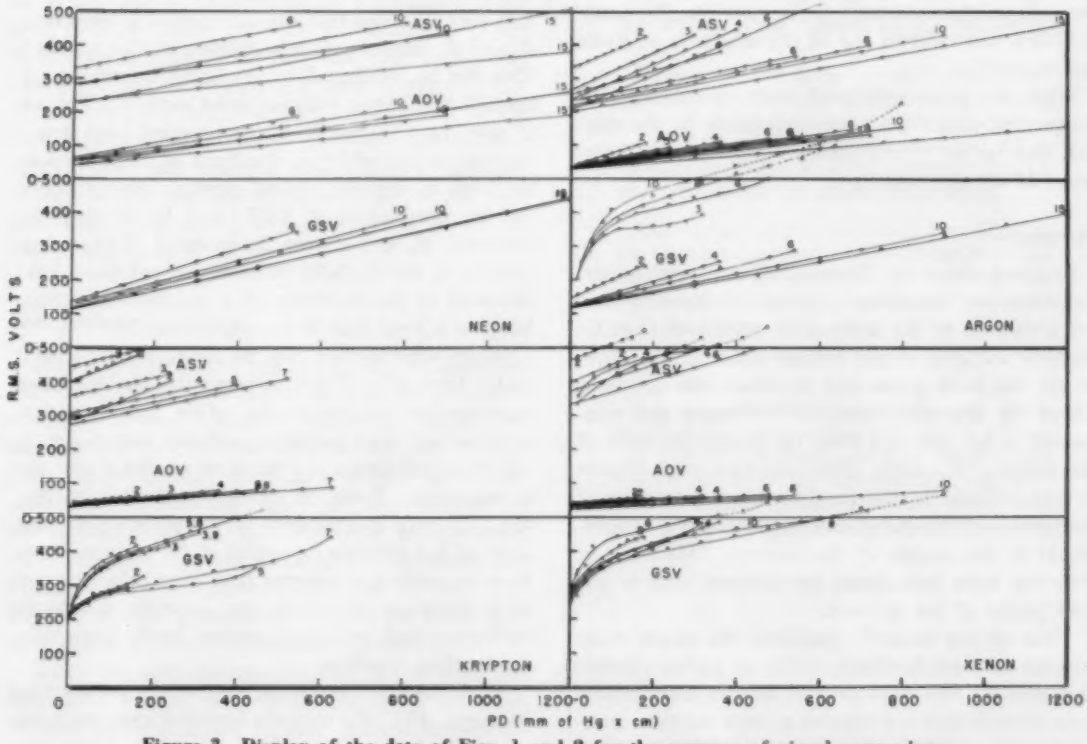

Figure 3. Display of the data of Figs. 1 and 2 for the purpose of visual comparison.

TABLE II.

Fill Gas	Arc Starting Current
Ne-Hg	130
A-Hg	41
Kr-Hg	27
Xe-Hg	16

TABLE III.

Gas	At. No.	At. Wt.	Arc Starting Current (ma)	A_s volts	B_s volts/cm	A_o volts	B_o volts/cm
Ne	10	20	130	330	1.4	44	1.4
A	18	40	41	235	1.5	19	1.0
Kr	36	84	27	275	1.7	14	0.6
Xe	54	131	16	335	2.1	10	0.5

exhibited lines of both mercury and the major gas in all of the inert gas mercury mixtures.

The spectrum of the positive column showed strong mercury lines in all mixtures containing mercury. In the case of neon and mercury, several neon lines appeared weakly in the region between 5700 and 7000 A. These may, however, have been due to scattered light from the region near the electrodes since red neon lines were emitted with great intensity from those regions. In the case of argon and mercury, only a few argon lines were discernible on the plates after eight-minute exposures. In krypton and mercury, four krypton lines, 5871, 5570, 4320, and 4274 A of medium intensity were found. In xenon and mercury, xenon lines appeared at 4624 and 4671 A. These were comparable in intensity to the 3126, 3132, 3341, 3663, 4078, 4770 and 5791 A lines of mercury. In the pure gases, all lines found could be identified in terms of the gas used. This was also true with the mercury rare gas mixtures except for a possible CN band at 3800 A observed in one of the mixtures of neon and mercury.

With the apparatus used, only the region between 2900 and 7000 A was accessible to observation due to the Pyrex walls of the tube and the range of the spectrograph.

Discussion

In gases where the Penning effect cannot occur, the atoms are ionized as two-stage processes by first being excited to the metastable state and then by electron collision to the ionized state. This occurs in all the pure gases and in those gas mixtures where the metastable state of the major gas component is far removed from the ionization state of the minor component. Since the two-stage process is proportional to the product of the number of metastable atoms and electrons present it is proportional to the square of the current. One-stage or Penning type ionizations are proportional to the first power of the current.

Thus at low current densities, the single stage process may predominate, while at higher current densities the two-stage process may be more important since it does not require as high electron energies as direct ionization from the ground state.

The information observed in Figs. 1, 2 and 3 can largely be explained in these terms along with the observations made in the introductory paper[1] concerning the linearity of the resulting voltages versus *Pd*. The non-linearity of the glow voltages of xenon, krypton, and mercury free argon presents a special case and will be discussed later.

The arc starting and operating voltages are in all cases, except those in which glow starting voltages are abnormally high, linear functions and can be compared through the relationships,

$$ASV = A_s + B_s d$$
$$AOV = A_o + B_o d$$

Table III compares the constants A_s, the extrapolated cathode drop during arc starting; B_s, the potential gradient during arc starting; A_o, the arc extrapolated operating cathode drop; and B_o, the arc operating potential gradient. The particular lamp chosen for this table contained mercury and was at a pressure of 6 mm Hg.

It may be noted that the arc operating constants, A_o and B_o decrease with increasing atomic number. This can be attributed to the lower ionization potentials and larger collision cross sections. The use of neon as a fill gas in the rapid-start lamp was a reasonable choice[2,3,4] in the light of these data as the high B_o insures highest electron temperatures for the production of 2537; and by heating the cathodes, A_o and A_s can be reduced. This reduction in A_o incidentally reduces the red neon light observed at the electrode of a non-heated cathode lamp to a level that is not objectionable.

Other observations can be made perhaps most easily from Fig. 3, which compares the mercury, mercury-free measurements. *AOV* measurements, at relatively high currents, indicate that the cathode drop voltages are dependent on the major gas in the tube. Potential gradients at this current are relatively independent of the presence of mercury with a possible exception of the neon mixture. It is interesting to observe that neon behaves much as a one-stage ionization gas probably due to its excitation and ionization energy levels lying relatively close together.

With the lower currents involved in arc starting voltages, *ASV*, the cathode drop voltages are again relatively independent of the presence of mercury.

The potential gradients are somewhat different, however, with the mercury-argon mixtures showing the greatest dependence on Penning ionization procedures as should be expected.

Only the mercury-neon mixtures exhibit *GSV* values that are comparable with the non-mercury measurements. Argon *GSV* values were so different from those of argon-mercury that filling of the tube with argon was used as a test for determining whether mercury was a contaminant at a specific time. It may be pertinent to remark that such a tests was made preceding and following the neon measurements.

Because of other measurements[5] too lengthy to be described in this paper, it is believed that the characteristic *GSV* curves for xenon and krypton and, particularly, the mercury free argon systems are due to the requirement that two milliamperes current flow between the electrodes before a glow discharge is considered to be started. The two voltages of importance in providing this condition are E_2 and a glow operating voltage sufficient to maintain a two-milliampere current. Briefly, the voltages to the left of the *GSV* curves inflection points are due to the E_2 values being greater than that required to provide the required current while to the right the reverse is true. If the accepted currents had been chosen to be zero, the curves would not have had an inflection point but would have approached exponentially a maximum voltage. With a higher current, the inflection would have been further to the left with following linear portion of the curve having a lesser slope.

In additional measurements on mixtures of the rare gases with and without mercury, the resulting cathode drop voltages and potential gradients took on values intermediate between those for the pure rare gases, depending somewhat linearly on the percentage of mixture.

Conclusion

This paper presents relative design information valuable for the production of gaseous elongated discharge devices including fluorescent lamps. Its use depends on the characteristics desired. Rapid-start lamps (heated cathodes) utilize the higher potential gradients and higher electron energies for the excitation of Hg 2537 available in neon-mercury mixtures. Lower electron temperatures are available in xenon-mercury systems. Lowest cold striking voltage systems can be selected from mercury-argon mixtures, pressures and lengths.

While the cathodes used in this paper were not externally heated, the results displaced to lower voltages because of the smaller cathode drop voltages, should be applicable to externally heated cathode systems.

This paper concludes a project started over ten years ago for determining the internal and external parameters effective in controlling starting voltages in elongated low pressure tubes and their relationship to previously determined basic gaseous electronic parameters.

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Reprints of
Recommended Levels of Illumination

Because of the great industry-wide interest generated by the Blackwell studies on required levels of illumination, a limited number of reprints of the feature, published in August IE, on "Recommended Levels of Illumination" is available. Price is 20¢ per copy in any quantity.

The 20-page reprint includes a description of the research procedure, a report of the IES Committee on Recommendations for Quantity and Quality of Illumination and the new footcandle recommendations for six areas — Office, Industrial, Institutions, Residences, Stores, and Marine Transportation.

Since the *complete* footcandle tables will not be published until they appear in the Third Edition, *IES Lighting Handbook*, next year, copies of this feature will serve for reference purposes until then. Order from Publications Office, Illuminating Engineering Society, 1860 Broadway, New York 23, N. Y.

INSTALLATION AT FARMERS STATE BANK, ALTO, MICH.

Lighting a Small Bank

LIGHTING OBJECTIVE: To provide a high level of general illumination for all banking tasks.

GENERAL INFORMATION: This 25 x 34½ x 10-foot bank serves a farming community with a population of about 200 people. Interior finishes are as follows:

Walls	Assyrian pine	34% RF	Counter front	light walnut	16% RF
	light walnut	16% RF	Desks	light walnut	16% RF
Ceiling	white acoustical tile	73% RF	Floor	red asphalt tile	18% RF
Counter top	black Formica	5% RF		cream asphalt tile	62% RF

INSTALLATION: Six rows of three Miller Co. No. STS2-LD-8T recessed Lucite lens bottom troffers are spaced on 5-foot 4-inch centers. Each unit is equipped with two 75-watt 96-inch T-12 warm white slimline fluorescent lamps. The average level of illumination was 90 footcandles after 2000 hours operation. The illumination level on the counter was 95 footcandles, with 65 footcandles on the office machines along the wall. Brightnesses at that time were:

Luminaires			Counter top	black Formica	1 fL
at 45 degrees crosswise		440 fL	Counter front	light walnut	6 fL
at 30 degrees lengthwise		390 fL	Desks	light walnut	10 fL
Walls	Assyrian pine	32 fL	Floor	red asphalt tile	11 fL
	light walnut	8 fL		cream asphalt tile	26 fL
Ceiling	white acoustical tile	50 fL			

Lighting designed by Arthur B. L. Slenker, Lighting Sales Engineer, Consumers Power Co., Grand Rapids, Mich. and installed by William Porritt, Alto, Mich.

Lighting data submitted by Arthur B. L. Slenker as an illustration of good lighting practice and to aid in the design of similar installations.

Published by the Committee on Publications of the Illuminating Engineering Society, 1860 Broadway, New York 23, N. Y.

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I. E. S. Council—1958-1959

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In addition to serving on Council, IES Regional Vice-Presidents have many duties in their own Regions, assisting Sections and Chapters. They also supply general guidance for the Regional Conferences. Times and locations for these Conferences during 1959 are listed here.

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Ottawa, Ont.

C. C. Shotwell
East Central
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Lord Baltimore Hotel
Baltimore, Md.

Robert W. Brown
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Conference: May 11-12
Continental Hotel
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Midwestern
Conference: May 6-8
Pere Marquette Hotel
Peoria, Ill.

Raymond L. Smart
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Banff Springs Hotel
Banff, Alta.

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Grove Park Inn
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No Conference since
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James D. Harris
Tennessee Valley Section
South Central Region

Edward Machtinger
Toronto Section
Canadian Region

Francis T. Tillemans
Twin City Section
Midwestern Region

Eric G. Nylund
Twin Ports Chapter
Midwestern Region

Jack W. Lowder
Utah Section
Inter-Mountain Region

W. G. McIntosh
Vancouver Island Chapter
Pacific Northwest Region

Thomas P. Harris, Jr.
Virginia Section
East Central Region

William Winglar
Western Michigan Section
Great Lakes Region

Robert R. Herget
Western New York Section
Great Lakes Region

A. C. Burnard
Winnipeg Chapter
Canadian Region

B. D. Barry, Jr.
Yankee Chapter
Northeastern Region

And These . . .

Photographs of the following Chairmen were not available in time for publication:

Alamo Section, Southwestern Region — Richard W. Barnes.

Chinook Chapter, Pacific Northwest Region — R. Shortreed

Cleveland Section, Great Lakes Region — L. O. Banahan

Eastern New York Section, Northeastern Region — John S. Baker

Edmonton Chapter, Pacific Northwest Region — F. R. Dorward

Mississippi Chapter, South Central Region — C. P. Haynes

Oil Capital Section, Southwestern Region — J. C. Netherton, Jr.

San Jose Chapter, South Pacific Coast Region — Rex Gardiner

Yosemite Chapter, South Pacific Coast Region — Irwin McMath

Chairmen of the Mexico and Quebec Chapters have not yet been elected.

Views and Opinions

On Lighting Education

The eye's light is a noble gift of Heaven! All things live from light; each fair created thing, the very plants, turn with a joyful transport to the light. — SCHILLER.

Light and lighting have made some notable advances in recent decades. The frontiers of yesteryear are the familiar territory of today; our adaptability and flexibility have been tested by successive waves of change, and we can anticipate continuity of change. We must be prepared in the lighting industry to meet both needs already identified and unknown future needs, for our most critical need a decade hence may be something which we do not now anticipate.

Light is essential for seeing. The range and variety of seeing tasks is increasing rapidly in our complex society. Everyone who works with light and lighting knows of the problems encountered in providing sufficient light on working areas and of the existence of many installations which do not provide optimal seeing conditions for workers. To avoid errors in this connection, one must think of the armature winder, the cabinet maker, the millman, the watchmaker, the stenographer, the bookkeeper, the switchboard operator, the student in the class room, the housewife in her kitchen, and all the many other types of workers who engage in seeing tasks. Too, one must not forget recreation, which requires seeing during television viewing, reading, and while pursuing hobbies such as stamp collecting and fine needlework. Truly, the burden and the responsibility of seeing have increased greatly in our complex modern society.

We have another reason for concern: our population is increasing rapidly. The net rise per day in population since 1950 is about 7600, a yearly increase of about 2.8 million. Unless the trend alters, the population in 1970 will near 210 million. The age composition of our population differs markedly today from that of the past; in 1900 life expectancy was only 47.3 years; now it has reached the Biblical level of three score and ten years, an increase of about 50 per cent. As our present middle-aged people reach the older brackets, large increases will occur in the age of 65 and above. This older group will pose new requirements, since old eyes require more light for seeing close work efficiently and comfortably.

The pattern of future population, then, poses two problems for the lighting industry: (1) the increasing numbers of people will place great pressure on schools and, subsequently, on the labor market; and (2) the social and individual problems posed by the rapidly increasing older people will multiply in ratio to their numbers. One may anticipate a striking increase in the range and complexity of lighting problems which will require solution.

All that I have said leads to the conclusion that society will require more varied and better service from the lighting industry in the future than has been true in the past. The industry should be planning and working now for meeting the demands for greater production and improved creative capacity. More and better researchers, sales engineers, and production engineers will be needed. The industry itself needs to be concerned with elevating the quality and increasing the quantity of talented lighting personnel of all kinds.

Problems will be encountered. Initially, one might mention the apparent apathy of the lighting industry itself. Training programs exist, of course, in various lighting organizations, but little attempt has been made to institute specific curricula designed to train lighting workers in colleges and universities.

My belief is that such efforts should be initiated now, so that opportunity will exist for development of adequate programs, in a few institutions for higher education at least, as pilot activities which may provide guidance for others hereafter when demand increases. I am outlining a proposed four-year course of study which may well provide the springboard for developing an adequate program for the training of lighting personnel. No claim is made that this course of study is adequate for the doing of a "turnkey job." Rather, it is intended to stimulate thought and constructive action leading to the establishment of a better and more efficient curriculum.

Comment on the content of the suggested program may be apropos. The purpose of lighting is to make seeing possible. Obviously, the lighting engineer needs to understand the mechanism of the eye and the way in which it operates; he must understand vision. Consequently, courses in ocular

A Tentative Program of Studies for Lighting Engineers at the College Level.[1]

FIRST YEAR

English Composition	3	English Composition	3
General Chemistry	4	General Chemistry	4
College Algebra	3	Analytical Geometry	4
Trigonometry	2	Slide Rule	1
Engineering Drawing	2	Engineering Drawing	2
General Physics	4	General Physics	4
Orientation	0	Orientation	0
	18		18

SECOND YEAR

Calculus	5	Applied Psychology	3
Statics	3	Calculus	3
Art, Drawing and Painting	3	Dynamics	3
Physical Optics	4	Basic Architectural Design	3
General Psychology	3	Business Correspondence	3
Engineering Profession	0	Physiological Optics	4
	18	Engineering Profession	0
			18

THIRD YEAR

Strength of Materials	5	Physics of Metals	3
Differential Equations	3	Electrical Circuits	3
Architectural Design	2	Stress Analysis	3
Structure of Metals	3	Interior Decorating	2
Ocular Anatomy and Physiology	5	Manufacturing Processes	2
		Psychological Optics	3
	18	Analysis of Engineering Data	2
			18

FOURTH YEAR

Illumination Engineering	3	Advanced Illuminating Engineering	3
Structural Design	3	Seminar in Illuminating Engineering	3
Economics	3	Sales Engineering	3
Industrial Accounting and Costs	3	Industrial Accounting and Costs	3
Technical English	3	Industrial Marketing	3
Salesmanship	3	Industrial Engineering	3
	18		18

[1]The numerals following suggested courses indicate semester hours of credit suggested.

anatomy and physiology, physiological optics, and psychological optics have been included. The sales engineer will need information about costs and accounting, economics, salesmanship, and marketing. The design engineer will profit by some knowledge of art, industrial engineering, architectural design, interior decoration, and technical report writing. In all situations, the worker basically is an engineer, so the fundamental training must be in that area.

The suggested program was compiled after a careful checking of the catalogs of twenty major universities offering training in engineering. An effort was made (1) to include types of courses that would contribute to successful achievement in the practice of lighting engineering, and (2) to use existing courses to the maximum extent. Of course, not all of the courses listed are offered in all of the twenty colleges, but each course (or a reasonably equivalent course) is offered in more than one of the institutions studied. Too, the courses as they exist may require some modification, provided proper prerequisites, required in some instances, have not been included in the suggested program. Merely to specify definite course titles, in a word, does not insure that existing courses may be used "as is." Problems will exist which require solution before such a program can be made final for offering to college students. One major problem well may be teaching personnel, since many collegiate institutions do not have in their faculties now instructors familiar with light and lighting as it exists today.

The existence of major problems, however, only accentuates the need for initiating a program for lighting education. To wait until a personnel crisis arrives is to invite trouble for the industry; we must make a start now to meet the future demands for lighting service that surely will come from our dynamic and progressive society.

I have attempted in this brief discussion to suggest a program for lighting education that may serve the industry to some extent in providing for its future requirements, provided the program is activated. In a sense, I have "blown a whistle" to start activity. If I have been successful in provoking thought and, ultimately, action that will solve this potential problem for the lighting industry, the job has been well worth the doing. — M. E. Broom, *Dean, Southern College of Optometry, Memphis 4, Tenn.*

National Lighting Expositions

It is high time that lighting, in a scientific, technological and creative sense, takes its proper place in the planning of our industrial environment. It is naive to act as though shelter — business or domestic — were mainly a rigid shell, the illumination of which is merely a simple matter of the addition of fixtures or the multiplication of lumens. We still concentrate too much on the refinement of the mechanical components which help to produce or package light rather than with the control of the effect of light itself.

The lighting industry, so far, has been acting as though its business were entirely concerned with uninhibited quantities of light and with the perpetuation of conventional configurations of our present bulb shapes. It is of greatest importance that the lighting industry organize a forum for the unbiased evaluation of light as a structural and psychological medium. Should we fail to do this, we might just as well admit that the lighting industry is nothing more than a vehicle for ingenious enclosures and shieldings from greater and greater light output.

The symposia at the National Lighting Exposi-

tions are an excellent start for this kind of exploration. Only through a free exchange of ideas among designers, engineers, architects and building managers can the lighting industry regain the creative role which it should have to ensure its survival as an essential business. — PETER MULLER-MUNK, *Peter Muller-Munk Associates, Industrial Designers, Pittsburgh, Pa.*

A. D. Hinckley Named Managing Director of IES

As one of his first official acts in the new fiscal year President George J. Taylor announced the appointment of A. D. (Dex) Hinckley as Managing Director of the Society. Mr. Hinckley has served as Executive Secretary of Illuminating Engineering Society since June 1944. In this new post, created by action of Council at its August 22nd meeting, the Managing Director is expected to function in four key areas —

1. More efficient and effective Headquarters operation,
2. Direct service to the officers and Council for their effective operation,
3. Long range analysis and planning,
4. Field service in connection with Region-Section-Chapter operation.

No changes are included, in the new set-up, in the responsibilities of the Society's other Senior staff. C. L. Crouch, as Technical Director will continue his responsibility for the technical work of the Society, including close cooperation with all technical committees. Clayton E. Ellis, Advertising and Sales Promotion Manager, continues to direct this phase of the Society's operation; Miss Ruby Redford, Editor of ILLUMINATING ENGINEERING will continue her responsibility for the Society's publication program in its Headquarters operation.

The most effective operation of the Society, which has greatly expanded in numbers and scope of program, has been the subject of discussion for many years. Several of these problems were brought into focus in the 1957 report of the Advance Planning Committee to Council, presented by Fred C. Winkler, Chairman. This report outlined the problem in part as follows: "When the Illuminating Engineering Society was much smaller, the President of the Society could, without difficulty, function as the executive head, preside at meetings, keep track of details of committee activities and make the few required journeys to visit Sections and Chapters. It is the firm conviction of the Advance Planning Committee, further confirmed by discussions with other Society members, that the duties of our President as at present constituted are almost, if not entirely, beyond the realm of what the Society could reasonably demand. It is the belief of the Advance Planning Committee that our organization should be augmented so that the President would be relieved of many of the detail operating duties, that is, many of the duties should be handled for him and he should be required to only approve or disapprove as his judgment dictates."

Because of the vital importance of the matter Council authorized that a study be made of the Advance Planning Committee's recommendations, by a well-known firm of Management Consultants, Cresap, McCormick and Paget. The resulting report was discussed by Council at its June meeting and was accepted in principle, action being taken to appoint a Task Committee to give the survey further study and to recommend a definite step-by-step program. The report of this Committee, headed by Past-President R. F. Hartenstein, was the basis for Council action.

A. Dexter Hinckley

Action of Council included approval of the establishment of another new position at Headquarters — to be known as Membership Secretary-Office Manager. This new staff member will assume many of the duties previously carried by the Executive Secretary and this position will be eliminated.

The newly named Managing Director, A. D. Hinckley, has many years of experience in the Illuminating Engineering Society. Prior to his appointment as Executive Secretary in 1944, he was an officer of the Society and member of Council serving terms as General Secretary and as a Director. In addition to service in a number of national committees he was active in the New York Section, serving as Chairman 1939-1940. Mr. Hinckley's interest in the field was developed while teaching in the Department of Electrical Engineering at Columbia University. Here he also served for ten years as Assistant to the Dean of Engineering, Dr. J. W. Barker, a Past President of I.E.S. (1932-1933).

Mr. Hinckley was for ten years Executive Secretary of the Columbia Engineering School Alumni Association, later being elected its President for three terms, 1950-1953. Since his election to membership in 1926, he has been active in Theta Tau, the national professional engineering Fraternity, and since December 1954 has served as its President. Mr. Hinckley is a registered professional engineer, State of New York, and a long time member of several professional organizations, including AIEE, ASEE.

Opening Session Ceremonies

Conference Statistics

Attendance:

Delegates	708
Ladies	262
Total	970

Place: Royal York Hotel, Toronto, Ont.

Time: August 17-22, 1958

Presiding: J. W. Bateman, Chairman
Conference Executive Committee

Attendance Award Winner: Winnipeg Chapter

Gavel rap opening the 1958 National Technical Conference, Toronto, was by Charles A. Amick, National Conference Committee Chairman, shown here welcoming the opening session audience. Awaiting introduction for their presentations, l. to r., are President K. M. Reid; President-Elect G. J. Taylor, and General Secretary R. G. Slauer.

Address of Welcome, by His Worship, Nathan Phillips, Mayor of Toronto.

Society's highest honor to C. A. B. Halvorson, left; Gold Medal and certificate presented by Pres. Reid.

Seven of ten new Fellows (See August IE page 8A) publicly honored by President Reid during opening session.

LIGHTING NEWS

1958 National Technical Conference

From 3 p.m. Sunday afternoon (August 17) continuously until 7 p.m., three queues of people moved steadily forward, lining up to register for the Toronto conference, and new queues formed in the morning. It all added up, finally, to the second largest attendance in IES history. Only New York's 1007 in 1953 exceeds Toronto's 970, and even that would be surpassed if the teen-agers counted. Something like 67 IES youngsters were on hand, for a wonderful convention of their own.

Report to Members

An opening session of an IES Conference is ever an impressive experience. Essentially it is a report by the Society's officers on the discharge of their duties, to the membership of the Society. This year, for the first time, it was also the occasion of the formal Annual Meeting of IES, an IES affair which had previously been conducted (in accordance with By-laws) the first Monday in October, in New York City, before a handful of people. Revised By-laws now permit this important meeting to be held in such circumstances that it may truly be, as it was intended, an open forum meeting of officers and members, with discussion and questions from the floor. Earnest and valuable open discussion of Society affairs and problems was the intent of the founding fathers in establishing such a meeting. In this, the first large Annual Meeting was greatly successful. President Kirk M. Reid, who presided, answered some ten pertinent questions raised spontaneously by members in the audience. Each of these questions, furthermore, tended to initiate extremely interesting further discussion of the subjects raised, greatly to the benefit of those who heard it. Quite likely holding the Annual Meeting in conjunction with the opening session may become a new IES conference tradition.

The Officers' Reports, the other main order of business at the opening session, are designated as Transactions of the Society and are recorded in full in IE (President and Vice-President, September issue; General Secretary's Report, December IE). Unquestionably, however, the in-person presentation of these reports is a valuable experience to delegates at the Conference; it is a significant fact that the hotel's largest meeting room is always required, and an empty chair would be hard to find. Perhaps it is the feeling of actual personal participation in Society activities each member gains in, for example, hearing *direct* from key committee men on their activities. This practice is an innovation of General Secretary Richard G. Slauer, who in the course of his report, calls on committee chairmen to amplify the report by their personal presentations. Brooks Chassaing, Membership Chairman, reported directly on this activity, and announced the results of the membership campaign. Winners of this contest received prize checks. (See box for their names.) Similarly Karl Staley reported on the Society's most constructive effort to build student membership and student education in lighting, through the Allied Arts program of which he is chairman. Numerous other phases of the past year's activities were reported by Mr. Slauer, and will be included in his published report in the December issue of IE.

Gold Medal

Several interesting ceremonies are traditionally a part of the conference opening. Foremost of these is, undoubtedly, the presentation of the IES Gold Medal and Certificate, highest honor in illumination. It was President Reid's honor at this session, to present this tribute for very great achievements in lighting to C. A. B. Halvorson (see August IE p. 7A). Text of Mr. Halvorson's address in accepting the Medal will be found on p. 28A.

Another pleasant duty for Mr. Reid

Past President's Luncheon. Clockwise, D. M. Jones, L. E. Tayler, S. G. Hibben, R. B. Brown, Jr., W. F. Little, H. H. Magdsick, George Crampton, Ward Harrison, Willard Brown, A. F. Wakefield, Walter Sturrock, E. M. Strong, Kirk Reid, George Taylor.

Allied Arts Board of Review — Toronto architects and consulting engineers judging entries for this coveted award: l. to r. Wm. Milne, Art Henschel, Alson Fisher, G. E. Mulvey, Kirk Reid, Geoffrey Davies.

Research session at Toronto may be historical event in illumination developments. Two of the research speakers shown, Drs. S. K. Guth and R. G. Hopkinson; session also featured Dr. H. R. Blackwell.

was the formal presentation of white lapel pins denoting Fellow Grade, to ten new IES Fellows. Details of the achievements which led to this distinction were published in the August issue, p. 8A.

President Reid, at this session, also recognized a distinguished visitor from abroad, Dr. Ralph G. Hopkinson, Vice-President of the British IES. Dr. Hopkinson brought good wishes from his Society, and also participated the following day in the Research Session, during which he presented a paper on his eagerly-awaited researches in glare from large sources. Another speaker at the opening session was Herbert H. Magdsick who outlined United States participation in the forthcoming CIE meeting to be held in Brussels next June. He also told of the British IES Golden Jubilee meeting, at which open house will be held for foreign visitors, June 11, 12 and 13, prior to the CIE gathering.

One very interesting departure for an opening session, was a special paper presented Monday morning, by Past-President S. G. Hibben. Dr. Hibben had developed extremely pertinent data on the problems of lighting in relation to the conquest of outer space, and held the audience spell-bound with his lecture and demonstrations.

Goddard trophy to triumphant winners of national contest for My Most Interesting Lighting Job. At left, winner in Class II, Noel Florence, New York Section; right, Marguerite Borelli, Central Oklahoma Chapter, Class I winner.

Technical Sessions

A glimpse of the published abstracts of the technical papers presented (September IE) corroborates that the Toronto conference saw very significant developments in illumination knowledge. The Canadian press was particularly interested in reports on three important researches presented at the Research Session Tuesday morning. These were studies on discomfort glare, by Dr. S. K. Guth, glare from very large sources by Dr. R. G. Hopkinson, and on visual data as a basis for recommended footcandle levels, presented by Dr. H. R. Blackwell. All of these papers will in due time be published in full in IE.

MMILJ

Probably the most widely popular program ever initiated by the Society is the national contest for My Most Interesting Lighting Job, now in its seventh year. This might be termed the Society's work in application: the fruits of developments in technique, sources and equipment. Programmers for the conference schedule no parallel session for this event — its aficionados include members from every level of lighting interest. The contest itself, however, is in parallel session, to accomodate the two classes which compete separately — commercial lighting and residential lighting. This year's contest, nationwide, had at the Section/Chapter level 186 total entries in both classes. Of these, 64 (winners at the Section/Chapter contests) competed further at Regional Conferences, and 22 winners of the Regional contests, as follows, were finalists at the national contest in Toronto. The results:

Class I — Residential

First Prize ($100): Miss Marguerite Borelli, Central Oklahoma Chapter, Southwestern Region.

Second Prize ($50): Miss Elizabeth Meehan, Philadelphia Section, East Central Region.

Third Prize ($25): George C. Schroeder, New Orleans Section, South Central Region.

Fourth Prize ($15): Mrs. Lucille Hanratty and Martin Klein, Cleveland Section, Great Lakes Region.

Runners-up: F. H. Rosenquist, Rocky Mountain Section, Inter-Mountain Region; William Kuhnke, Milwaukee Section, Midwestern Region; Sylvan R. Shemitz, Connecticut Section, Northeastern Region; Mrs. Grace Shoeni, Oregon Section, Pacific Northwest Region; Robert J. Kuzell (honorable mention), Georgia Section, Southeastern Region and J. Grant Florin, Southern California Section, South Pacific Coast Region.

Judges for Class I were Peggy Lidstone, W. A. Dalrymple and Joseph Thomas.

Class II — Commercial

First Prize ($100): Noel S. Florence, New York Section, Northeastern Region.

Second Prize ($50): James F. Fletcher, Mid-South Chapter, South Central Region.

Third Prize ($25): Clifford Crookes, Northwestern Ohio Section, Great Lakes Region.

Fourth Prize ($15): George Watson, Toronto Section, Canadian Region.

Runner-up: G. William Wagner, Philadelphia Section, East Central Region; Norman Winchester, Rocky Mountain Section, Inter-Mountain Region; Melvin Cohen, Chicago Section, Midwestern Region; Alex G. Drapes, Inland Empire Chapter, Pacific Northwest Region; Robert E. Faucett, Palmetto Section, Southeastern Region; Coy C. Jordan, Tar Heel Section, Southeastern Region; J. L. Gates, Southern California Section, South Pacific Coast Region and Leslie E. Hamilton, North Texas Section, Southwestern Region.

Judges for the Class II contest were Joseph Browder, Duncan Jones, Carter Lewis and J. Carl Wilson.

Progress Report

How can one describe this show? It has to be seen! Essentially its purpose is educational — a round-up of 1958 lighting developments from all over the world. So gifted are its perpetrators though, that it is, in addition, a most professional production. E. A. (Red) Linsday was chairman this year, heading an equally gifted cast. Their pre-conference planning and during-conference sweat and tears paid off in a marvelous show. Wise conference attendees dine quickly Progress Report night, and hustle for a seat. They're crowded out, else, from the hotel's largest ballroom.

Theme of the report was "Reaching for the Sun." How close lighting techniques, sources and equipment come to reaching sunlight levels was the substance of many of the demonstrations. Most dramatic of these was a sunlit patio, complete with beautiful girl, over which man-made sunlight got brighter and brighter (rows and rows of PAR lamps separately switched) until artificial sunlight of tens of thousands of footcandles were provided.

Another dramatic moment was the opening effect, introducing the theme. The whole auditorium was filled with the sound of a rocket taking off. During this, the room darkened to reveal a huge blacklighted rocket filling the stage. Certain parts of this opened to display new wrinkles in lighting developments.

Another clever touch was the trolley duct arrangement across the stage from which hung new developments in fixtures. These lighted up one at a time from the touch (so it seemed) of a "magic" wand of a pretty girl.

Anyone describing in mere words the

National contestants for MMILJ, picture at top Class I: front row, Marguerite Borelli, Betts Meehan, Norman Bethune, George Schroeder, Lucille Hanratty. Back row, Sy Shemitz, Bill Kuhnke, Harold Rosenquist, Bob Kuzell, Grace Schoeni, Martin Klein. Picture at bottom Class II contestants: front row, Noel Florence, Bob Faucett, Bill Wagner, Ben Hartmann, Gene Fleming. Back row, Clifford Crookes, Leslie Hamilton, James Fletcher Melvin Cohen, and George Watson.

Canadian Region's MMILJ contest was held Sunday night before the Conference. Contestants in this semi-final are: George Watson, Toronto Section, Bernie Monaghan, Montreal Section, and Norman Bethune, (Class I) Toronto Section.

Citation of Achievement to E. W. Commery, right, on his retirement. Pres. Reid made the presentation for the Society.

clever, spectacular and educational aspects of the Progress Report, is reduced from the start, to understatement.

Awards

In addition to the Medal, Fellow Pins and Goddard Trophy (MMILJ), the conference is the occasion for several other awards and honors. Perhaps the most keenly contested of these is the "Travel Gavel," the attendance award made to the Section or Chapter having the greatest number present, in relation to the total membership of their Section and to the number of miles traveled. Winnipeg Chapter captured this prize — silver mounted gavel and anvil, to be held by the Chapter until next year's contest, and their name to be forever engraved on it. The Winnipeg group, some 16 strong, loyally proclaimed their origin all week by wearing huge yellow buttons identifying their Chapter.

The Clarence Law Trophy for golfers was won by John R. Fritz, last year's secretary of the Eastern Pennsylvania Section.

Allied Arts Committee, under the direction of Karl Staley, Chairman, had an extremely interesting display featuring six lighting designs developed by architectural students from several universities. These designs represented previous winners of awards from contests among architectural students conducted by this committee at numerous universities throughout the year. They competed for further recognition in Toronto, in a contest judged by a Board of Review made up of prominent Toronto architects and consulting engineers. Top award for his design went to Edward H. Crane, an architectural student at University of Southern California. Second prize was Miyoko Mori jointly with Edward Carroll of Pratt Institute; third was Roy Vollmer, Jr., Penn State. Honorable mentions were H. William Nilsen, U. of Cincinnati, Tatuo Ikari, Waseda University, Japan(submitted all in English), and Joseph Boehning, University of Mexico. Winners received a certificate of award signed by the President of IES and by members of the Board of Review.

A special Citation of Achievement was awarded to E. W. Commery, long a leading engineer in Residential lighting, on the occasion of his retirement. The Citation, signed by the five top officers of IES, was presented to Mr. Commery by President Reid, during the Residential Industry luncheon held Tuesday noon.

Excursions

This conference, because of its site and timing, was billed as an ideal opportunity for a vacation as well as a valuable meeting. That it was. On Wednesday afternoon, for example, all sessions ceased and even the most indefatigable committee attender took off either for Niagara Falls (special IES bus, 90 miles) or went to the "Ex." This last is the extraordinary Canadian National Exhibition, now in its 80th year as a world showcase par excellance. For this one day at least, dignified IESers were spied gawking down the Midway, or retrogressing to candy apples on a stick.

Niagara Falls had recently been relighted (see p. 552 this issue), so delegates choosing this excursion could offer themselves the excuse of combining business with pleasure. A similar aura of conscientiousness could add to the pleasure of the group who toured the CBC broadcasting studio (by special arrangement of Canadian committee members) and those who toured Toronto in an auto pool to view its street lighting practice.

The ladies' excursions, however, and those of the teen-agers, were strictly for pleasure, a wonderful vacation, for sure. All of their tours had been arranged by the Ladies Committee, under Dorothy Wilson, Chairman, and they represented the cream of Toronto's activities. Lunch was at the very swank Royal Canadian Yacht Club, reached by ferry across the bay. The Yacht Club's terribly smart swimming pool was another attraction. Also on the program was a tour of fabulous Casa Loma, with luncheon there; ditto the Old Mill, one of Toronto's most unusual eating spots.

In addition to the wonderful vacation trips arranged for them, the ladies also breakfasted together each morning—usually all 262 of them.

Teen Doings

Nobody, but nobody, had more fun than the 67 teen agers who went to Toronto. They had their own printed pro-

(Continued on page 14A)

Membership Committee Prize

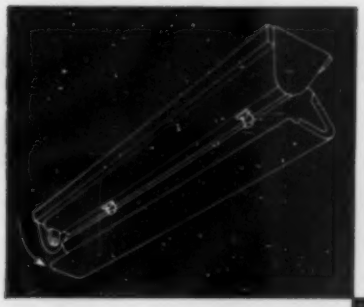
Winners: Gross Gain

Golden Gate Section	Group I
Rochester Section	Group II
Southeast Florida Sec.	Group III
Panhandle Chapter	Group IV

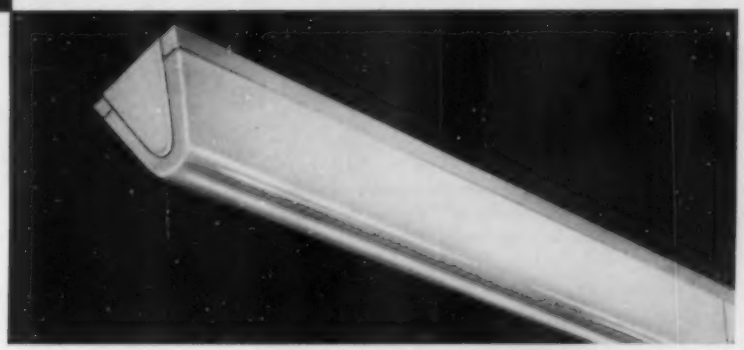
Winners: Net Gain

Golden Gate Section	Group I
Rochester Section	Group II
Miami Valley Section	Group III
Panhandle Chapter	Group IV

Winnipeg Chapter won the travel gavel. Some of their large delegation, with the large yellow buttons they wore all week, are: Front row, K. L. Philip, V. S. Buckler, K. Hand, N. Baldwin, J. B. Wolk. Back row: E. T. Battle, F. McNamara, J. Zanewich, A. Bertrand, L. Rittenberg.



details make the difference



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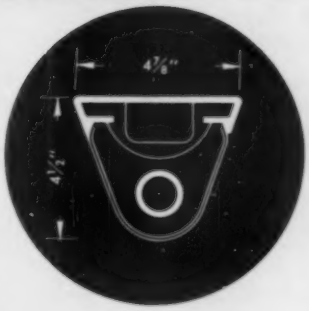

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FLORIDA
Miami: Forrey's Whsle. Hdwe. Co.

GEORGIA
Atlanta: Atlanta Ltg. Fix.
Noland Co.

ILLINOIS
Chicago: Efengee Elec. Sup. Co.
Englewood Elec. Sup. Co.
Hawkins Electric
Hyland Elec. Sup. Co.
Wholesale Elec. Sup.
Elgin: Fox Elec. Sup.
Rockford: Englewood Elec. Sup. Co.
Springfield: Springfield Elec. Sup.

INDIANA
Ft. Wayne: Mossman-Yarnelle Co.
Gary: Englewood Elec. Sup. Co.
So. Bend: Englewood Elec. Sup. Co.

IOWA
Des Moines: Weston Lighting Co.

KANSAS
Kansas City: W. T. Foley Elec. Co.

KENTUCKY
Paducah: Ohio Valley Sup.

LOUISIANA
Baton Rouge: Electrical Wholesalers
New Orleans: Interstate Elec. Co.

MAINE
Bangor: Standard Elec. Co.
Portland: Holmes Elec. Supply Co.

MARYLAND
Baltimore: Excello Public Serv. Corp.

MASSACHUSETTS
Boston: Mass. Gas & Elec. Light Co.
Henry L. Wolfers Inc.
Fitchburg: Service Elec. Sup. Co.
Pittsfield: Carr Supply
Springfield: Eastern Elec. Sup.
Worcester: Atlantic Elec. Sup.
Benjamin Elec. Sup.

MICHIGAN
Detroit: Madison Elec. Co.
Michigan Chandelier Co.
Flint: Royalite Co.
Grand Rapids: Purchase Elec. Sup. Co.
Pontiac: Standard Elec. Co.
Saginaw: Standard Elec.

MINNESOTA
Duluth: Northern Elec. Sup. Co.
Minneapolis: Charles A. Anderson & Co.
Northland Elec. Sup. Co.
St. Paul: Lax Elec. Co.

MISSOURI
St. Louis: M. K. Clark

NEBRASKA
Omaha: Electric Fix. & Sup. Co.

NEVADA
Reno: Western Elec. Dists. Co.

NEW HAMPSHIRE
Portsmouth: Mass. Gas & Elec. Light Co.

NEW JERSEY
Atlantic City: Franklin Elec. Sup. Co.
Camden: Camden Elec. Fix. Co.

NEW MEXICO
Albuquerque: Albuquerque Dist. Co.

NEW YORK
Albany: Havens Elec. Co. Inc
Binghamton: Freije Elec. Sup. Co.
Buffalo: Buffalo Incat. Light Co. Inc.
Niagara Falls: Wynen Sup. Co.
Poughkeepsie: Electra Sup. Co.
Rochester: Rowe Electric Sup. Co.
Syracuse: Superior Elec.

NORTH CAROLINA
Charlotte: Independent Elec. Sup.
Durham: Noland Co.
Greensboro: Elec. Sup. & Equip. Co.
Kinston: Kinston Elec.
Winston-Salem: Noland Co.

OHIO
Akron: The Sacks Elec. Sup. Co.
Canton: The Electric Sales
Cincinnati: B. & B. Elec.
F. D. Lawrence Electric Co.
Cleveland: N. Lavi Electric
Columbus: Elgee Elec. Co.
The Loob Elec. Co.
Dayton: Duellman Elec. Co.
Toledo: Gross Elec.
Youngstown: Mart Industries

OKLAHOMA
Tulsa: Lawson Elec. Co.

PENNSYLVANIA
Allentown: Coleman Elec. Co.
Erie: Kraus Elec. Co.
Harrisburg: Fluorescent Sup. Co.
Hazleton: Power Elec. Co. Inc.
New Castle: Midwestern Elec. Co.
Philadelphia: Ace Lighting Fix. Co.
Gold Seal Elec. Sup. Co.
Sylvan Elec. Fix. Co.
Pittsburgh: Allied Elec. Sup. Co.
Argo-Lite Studios
Doubleday-Hill Elec. Co.
Wally Elec. Sup. Co.
Reading: Coleman Elec. Co.
Scranton: Lewis & Reif
Wilkes-Barre: Anthracite Elec. Sup. Co.

RHODE ISLAND
Pawtucket: Major Elec. Sup. Co.
Providence: Leavitt Colson Co.

SOUTH CAROLINA
Anderson: Sullivan Hdwe. Co.
Columbia: Capitol Elec. Sup. Co.
Noland Co.
Greenville: Sullivan Hdwe. Co.

SOUTH DAKOTA
Watertown: J. H. Larson Elec. Co.

TENNESSEE
Johnson City: Noland Co
Nashville: Nashville Elec. Sup. Co.

TEXAS
Dallas: Rogers Elec. Sup.
Ft. Worth: Anderson Fixture Co.
Houston: Merlin Associates
San Antonio: Southern Equip. Co.

VIRGINIA
Arlington: Dominion Elec. Sup. Co. Inc.
Noland Co.
Lynchburg: Mid State Elec. Sup. Inc.
Norfolk: Noland Co.
Roanoke: Noland Co.

WEST VIRGINIA
Charleston: Goldfarb Elec. Sup. Co.
Virginian Electric Inc.
Huntington: West Virginia Elec. Co.
Wheeling: The Front Co.

WISCONSIN
Appleton: Moe Northern Co.
Eau Claire: W. H. Hobbs Sup. Co.
La Crosse: W. A. Roosevelt Co.
Milwaukee: Lappin Elec. Co.
Standard Elec. Sup.

WASHINGTON
Seattle: Seattle Lighting Fix. Co.

ALASKA—*Anchorage:* Northern Supply Co.

CANADA
Montreal: The Gray Elec. Co.
Toronto: Revere Elec. Dist.
Toronto Elec. Sup. Co.

HAWAII
Honolulu: Hawaiian Light. & Sup. Co.

Conference Chairman J. W. Bateman, center, presided at Conference highlight, the President's Banquet. Flanking him, outgoing and incoming Presidents.

A thrilling moment at every Conference — acceptance of the gavel of office. At Toronto Kirk Reid, left, to the new President, George Taylor.

(Continued from page 12A)

gram, their own meeting room, a special committee looking out for their interests, and gifted hostesses smoothing out all of their excursions. They went to the "grown up's" banquet too, all in formals, and had their own tables there. Even the orchestra at the dance was on their side, and every so often gave with a good jump arrangement while the floor cleared of all but the teen cats.

It's hard to say which was the most. High on the list though, would be the Calypso Party they had in their own party room on Monday night. They had a long-play record player and a pile of good jivey platters, and had themselves a real ball, consuming Coca Cola by the case. About 47 kids attended this party, from all points in North America.

The Granite Club pool, a real nice Toronto place, was open every morning and afternoon for swimming just for the teens, and of course they also went swimming at the Yacht Club. This was all in addition, of course, to group tours through CBC, to the Observation Gallery of the Canadian Bank of Commerce, Casa Loma, the Old Mill and the Exhibition.

Banquet

To describe this as brilliant seems trite, but that's what it was. The Banquet Committee and the Decorations and Display Committee furnished many of the factors leading to this brilliance. Quite obviously the ballroom was professionally decorated — and relighted. Massed silk flags of both countries lent a beautiful backdrop to the speakers table; Donald McKenzie in full Highland dress piped in the head table; exceptionally beautiful menu-programs served as souvenirs. IESers' talent for gaiety, however, furnished its own good share to the proceedings.

A big moment at every banquet is the induction of the new President. In this ceremony, Kirk Reid handed the gavel of office to incoming President George J. Taylor. He, in turn, affixed the diamond-studded Past-President's Pin on Mr. Reid's lapel. Mr. Reid's introduction of George Taylor was another of the clever touches at IES affairs which so astound visitors new to these events. A pseudo-applause meter registered audience response to well-known characteristics of the new president as they were mentioned in the introduction.

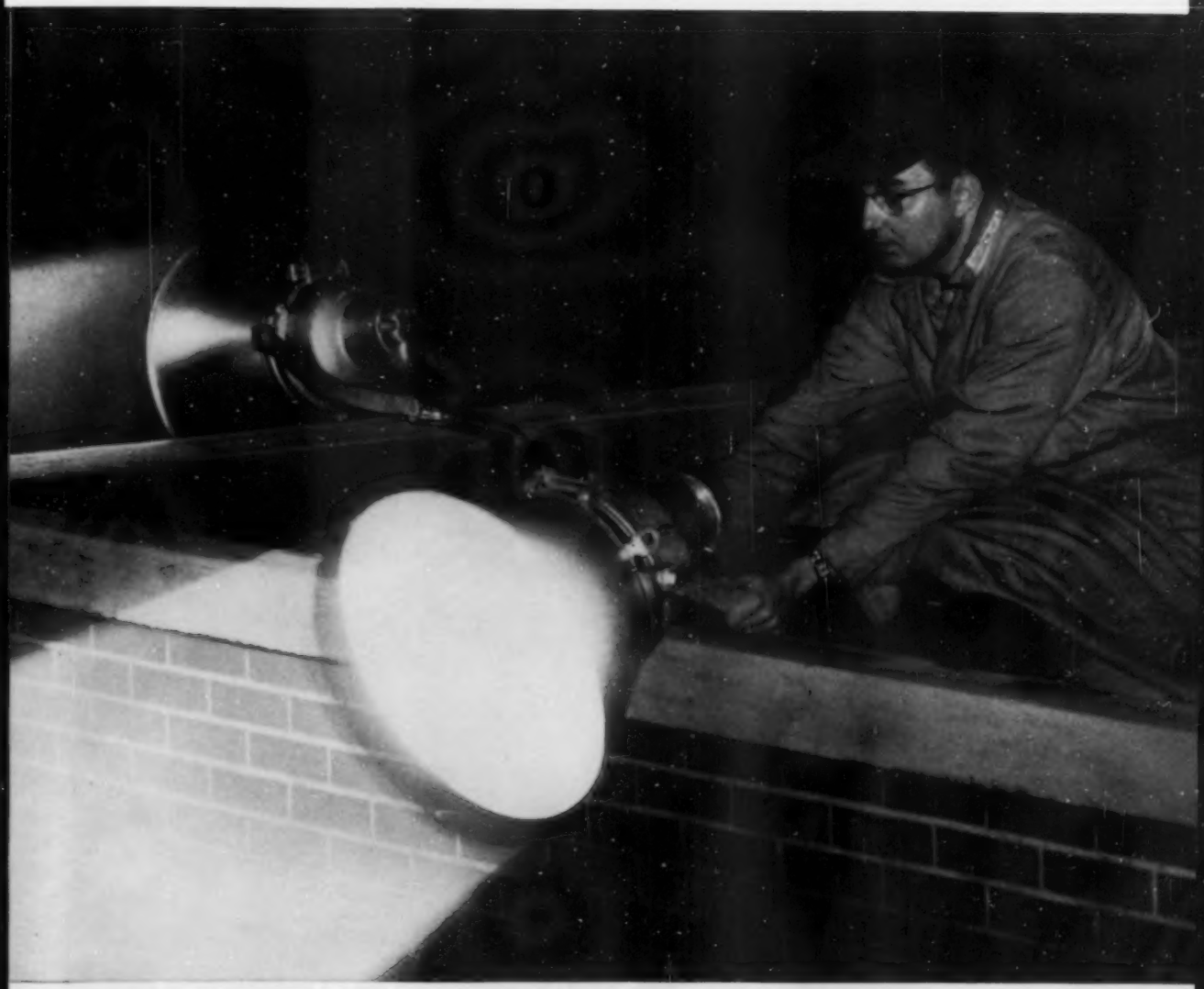
As a final memento of the outgoing President's successful year, Mr. and Mrs. Reid were presented with a gift selected to be truly Canadian. This was an Eskimo sculpture beautifully executed in polished native stone, carved by a native Eskimo artist of Hudson's Bay. The carving is similar to the sculpture presented to the Eisenhowers, commemorating their visit to Canada. And as a tribute to Mrs. Reid, Dorothy Wilson (Mrs. J. Carl) presented roses on behalf of the conference committee.

Receiving line, Toronto Conference, l. to r., J. W. Bateman, Conference Chairman, Mrs. Bateman, J. Carl Wilson, Canadian Regional V-P, Mrs. Taylor, President-Elect George Taylor, Mrs. Reid, President Kirk Reid, Mrs. Wilson.

Extra-Curricular

Several events not listed on the official program were nevertheless significant parts of the conference proceedings. The annual Past President's Luncheon, for example, is now a tradition with IES conferences. Attending it this year were: Past-Presidents R. B. Brown, Jr., Willard Brown, George Crampton, Ward Harrison, S. G. Hibben, D. M. Jones, W. P.

(Continued on page 19A)



Up to 163 Degree Spread — Up to 236,000 Candlepower: Now in

New CROUSE-HINDS Mercury Floodlights

Plus 6 Outstanding Advantages Never Before Offered in Mercury Floodlights of this Wattage

New—700 to 1,000 watt mercury floodlights with the widest beam-spread on the market . . . up to 163°. Or the brightest . . . 236,000 candlepower concentrated in a 75° solid angle! Complete with ballasted assemblies that will start lamps at —30° F. offering a further choice of three different reflectors and four different lenses (including a spun-sealed plate glass lens) to adjust the beam-spreads and candlepowers to your particular needs. All using either clear lamps for brightness, or phosphor-coated lamps for color enhancement. And all offering rear-door relamping and positive locking in open position.

Mercury Floodlighting Is Here to Stay

No other floodlight lamp approaches mercury for long burning hours . . . for economy of cost and labor in relamping. And no other mercury floodlight approaches these new MVF's for convenience of relamping, aiming, utilization factor and maintenance of output over a long period of burning. Other lights in the Crouse-Hinds range of floodlights from 250 to 700 watts provide varying beam spreads, intensities and efficiencies.

* For assistance in computing the exact fixtures, wattages and footcandles for your needs, consult your Crouse-Hinds distributor or the Illumination Department at the Factory.

CROUSE HINDS

MAIN OFFICE AND FACTORY: SYRACUSE, NEW YORK

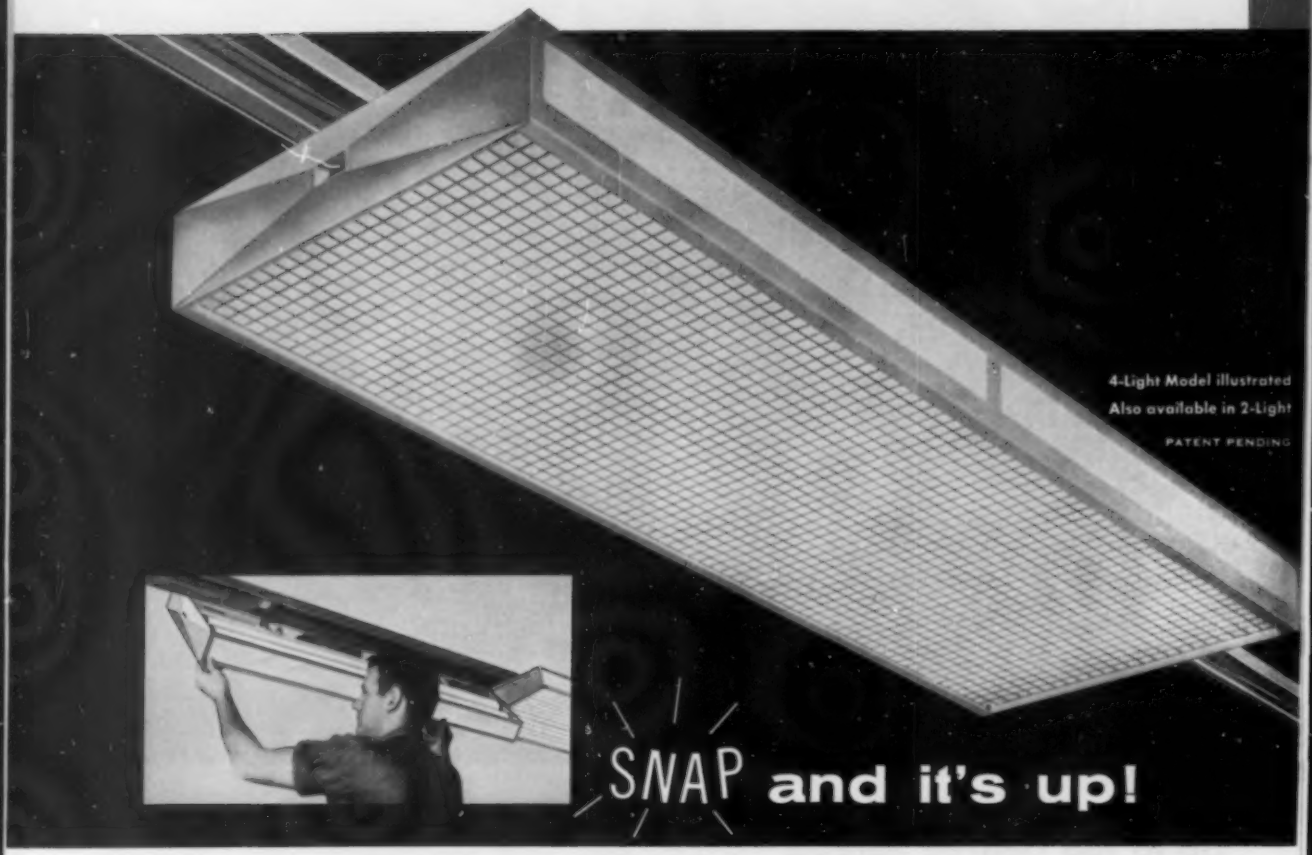
Crouse-Hinds Company of Canada, Ltd., Toronto, Ont.

Crouse-Hinds Instrument Company, Inc., Silver Spring, Maryland

★ CONDULET® ELECTRICAL EQUIPMENT (Explosion-Proof and Conventional) ★ FLOODLIGHTING
★ TRAFFIC CONTROL SYSTEMS ★ AIRPORT LIGHTING and WEATHER MEASURING EQUIPMENT ★

These products are sold exclusively through electrical distributors. For application engineering help, contact one of the following offices: Atlanta Baton Rouge Birmingham Boston Buffalo Chicago Cincinnati Cleveland Corpus Christi Dallas Denver Detroit Houston Indianapolis Kansas City Los Angeles Milwaukee New Orleans New York Omaha Philadelphia Pittsburgh Portland, Ore. St. Louis St. Paul Salt Lake City San Francisco Seattle Tulsa Washington **Resident Representatives:** Albany Baltimore Charlotte Chattanooga Reading, Pa. Richmond, Va.

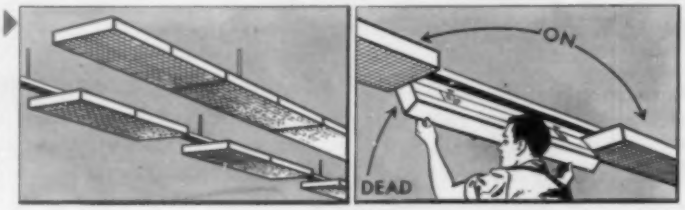
NEW GIBSON ORTHO-66



unequalled for flexibility and ease of maintenance

CONTINUOUS ROW OR INTERVAL MOUNTING

The Ortho may be mounted in continuous rows or at intervals of 4, 8, 12 or more feet. Fixtures can be added, removed or re-spaced at any time by one man without tools.



REMOVAL OF FIXTURE WON'T INTERRUPT OTHERS

Any fixture may be removed for cleaning or repairs at any time without interrupting the other fixture in the row. When a fixture is unlatched, it disconnects itself.

Gibson LIGHTING

GIBSON MANUFACTURING COMPANY

1919 Piedmont Circle, N. E., Atlanta 9, Georgia

MANUFACTURED IN CANADA UNDER FRANCHISE BY ELECTROLIER MANUFACTURING CO., LTD. MONTREAL

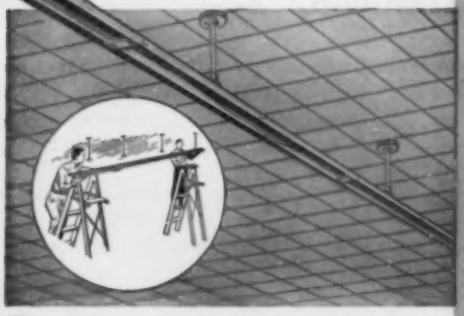
another fine fixture that plugs in on the exclusive Gibson Uni-race*

4 SIMPLE STEPS that save over 75% on installation labor costs

Because the Ortho fixture eliminates so many of the time-taking operations common to conventional installations, it easily saves more than 75% in labor. Contractors report that all labor, including stems and lamping, averages only 17 to 22 man minutes per fixture, as compared with the NECA standard of over 2 man hours for conventional fixtures.

1 Assemble the Uni-Race • The exclusive Gibson Raceway, known as the Uni-Race, can be assembled on the floor in lengths up to 200 feet. The four or eight-foot sections are joined by telescoping couplers which provide a smooth, rigid union of the sections and are fastened with self-tapping screws.

2 Wire the Uni-Race • Branch-circuit wires are laid in the Uni-Race and connection is made at each built-in receptacle. The receptacles will later receive the plug that is built into each fixture. The Uni-Race, U. L. approved as a raceway, has a capacity of five No. 8 AWG wires or eleven No. 14 wires.



3 Hang the Uni-Race • The rigid Uni-Race is easily lifted and hung in any of several different ways. Lengths up to 200′ can be hung as a unit if supported every 24′ while being raised to mounting position. When the branch-circuit connection is made, the Uni-Race is ready for the fixtures.

4 "Plug In" the Fixtures • The fixtures are merely "plugged in" on the Uni-Race. Hooks on the fixture engage in slots on one side of the Uni-Race, acting as hinges. The fixture is swung closed and latched. The built-in plug on the fixture automatically connects with the receptacle in the Uni-Race.

* **UNI-RACE NOW U. L.-APPROVED AS A 225-AMP RACEWAY** • The Gibson Uni-Race is now U. L.-approved as a raceway with capacity for five No. 8 AWG wires or eleven No. 14 AWG wires. It will house the circuitry for a 200-foot continuous run of two-light fixtures (either 40 or 75 w.) or a 100-foot run of 4-light fixtures.

WRITE FOR COMPLETE INFORMATION ABOUT THE GIBSON ORTHO LINE

H. U. Hjermstad, Vice President, Engineering, discusses the development viewpoint on "conservative design"

"Creative engineering makes the difference in Sola Fluorescent Ballasts"

The atmosphere in Sola Electric engineering labs is pleasant, yet there is an undertone of restlessness. A paradox? Maybe. But it's one that we feel is understandable and desirable.

Any design engineer worth his salt is happy when he's turned loose in a well-equipped lab and told to produce the best fluorescent ballast possible. We tell him to take the "radical approach" to "conservative design". In other words, he's to "design in" *more* than is needed in materials and workmanship, so as to make sure a Sola ballast will deliver rated performance . . . *plus*. However, until he produces that hypothetical "perfect ballast" we will continue exploring new ideas . . . new approaches.

The Sola Constant Wattage Fluorescent Ballast you buy today is cool, quiet, and gives full lumen output and long lamp life. It is designed and built to surpass CBM standards. We sincerely believe it's the best on the market and we're constantly working to make it still better.

Write for "An Analysis of Fluorescent Lighting System Costs," Report 3J-FL-281

Sola Electric Co., 4633 W. 16th St., Chicago 50, Ill., Bishop 2-1414 • Offices in principal cities • In Canada, Sola Electric (Canada) Ltd., 24 Canmotor Ave., Toronto 14, Ont.

SOLA

CONSTANT VOLTAGE TRANSFORMERS

REGULATED DC POWER SUPPLIES

MERCURY LAMP TRANSFORMERS

FLUORESCENT LAMP BALLASTS

(*Continued from page 14A*)

Little, H. H. Magdsick, E. M. Strong, Walter Sturrock, L. E. Tayler, A. F. Wakefield, and President Kirk Reid. Incoming President George J. Taylor was host, also per tradition.

A special luncheon was also scheduled Tuesday noon for members of the residential lighting profession present at the conference. This was chairmaned by Miss Virginia Skinner, Chairman of the Residence Lighting Forum Committee and was attended by 47 men and women from this branch of lighting. One feature of this, as already mentioned, was the presentation of a Citation of Achievement to E. W. Commery, who retired October 1 after 42 years of outstanding work in the residential lighting field.

An extremely pleasant luncheon party, strictly extra-curricular, was given by George J. Taylor for all of the 1958-1959 Regional Vice-Presidents and their wives who were present at Toronto. No business was transacted; it was a purely social gathering during which Regional V-Ps throughout the country made his acquaintance and each other's.

Committee meetings, of course, aren't exactly extra-curricular, being a very important part of every conference. Restricted to hours which will not interfere with attendance at sessions, they were scheduled every possible other moment at breakfast and luncheon meetings, and well into the night. There were, on a rough count, something like 12 major committee meetings held in Toronto; Council itself had a meeting scheduled in Toronto. This was the first Council meeting of the 1958-1959 administration, with incoming President George Taylor presiding, and was held on Friday, August 22, the day following the close of the 1958 National Technical Conference.

Residential Lighting Industry luncheon is now a Conference fixture. Toronto attendance — 47.

FOR THE RECORD

Details of the Toronto conference program are listed in full, for permanent record:

August 18

Morning Session — C. L. Amick, Presiding
Invocation: President Kirk M. Reid
Greetings from City of Toronto: His Worship, Mayor Nathan Phillips, Q.C.
Welcome from Hydro Commission: Bert Merson, Chairman, Toronto Electric Commissioners
National Officers Report:
President, Kirk M. Reid
General Secretary, R. G. Slauer
President-Elect, George J. Taylor
Introduction of Fellows, 1958: President Reid
Presentation of IES Medal to C. A. B. Halvorson
Illuminating Engineering in Space: S. G. Hibben
Announcements: J. W. Bateman, Chairman Conference Executive Committee.

Applications Session (Parallel)

Chairman — James L. Cox, Duro-Test Corp., North Bergen, N. J.

Discussion Organizer — A. Makulec, General Electric Co., Nela Park

1. Floodlighting Niagara Falls: W. A. Dalrymple and C. A. Albini, Amalgamated Electric Corp., Toronto, Ont.
2. Evaluation of Performance of Polystyrene Components of Fluorescent Luminaires in Actual Service and Under Accelerated Testing:* D. A. Popielski, R. A. McCarthy, Plastics Div., Monsanto Chemical Co., Springfield, Mass.
3. Economics of Fluorescent Reflector Lamps: C. N. Clark, N. F. Meyer, General Electric Co., Cleveland, Ohio.
4. A Simple Approach to Group Relamping of Fluorescent Lamps: E. W. Beggs, Westinghouse Electric Corp., Bloomfield, N. J.
5. Design and Application of a New High Frequency Power Source for Fluorescent Lighting:* W. H. Johnson, J. L. Winpisinger, Cleveland, Ohio and J. F. Roesel, Jr., Cheswick, Pa., all of Westinghouse Electric Corp.

Photometry Session (Parallel)

Chairman — H. F. Davidson, Curtis Lighting of Canada, Ltd., Toronto, Ont.
Discussion Organizer — A. W. Weeks, Champion Lamp Works, Lynn Mass.

6. Vertical Distribution of Light from Gas-filled Candlepower Standards:* L. E. Barbrow, S. W. Wilson, National Bureau of Standards, Washington, D. C.

*Accepted by the Papers Committee as a Transaction of the Illuminating Engineering Society.

(*Continued on page 22A*)

Conference Attendance Past Ten Years

1948	Boston, Mass.	906
1949	French Lick, Ind.	668
1950	Pasadena, Calif.	556
1951	Washington, D. C.	765
1952	Chicago, Ill.	859
1953	New York, N. Y.	1007
1954	Atlantic City, N. J.	857
1955	Cleveland, Ohio	754
1956	Boston, Mass.	960
1957	Atlanta, Ga.	926
1958	Toronto, Ont.	970

Luncheon party for next year's RVP's and their wives, given by Pres.-Elect George Taylor.

Now... recessed "ribbons of light"

that fit all modern ceiling systems:

Sylvania's Shallow Troffer Series

in both 1-foot and 2-foot widths

NOW YOU CAN SPECIFY recessed "ribbons" of light with nearly every type and make of ceiling material used today. That's because each model in Sylvania's new Shallow Troffer Series is available with one of *three* different types of housing (see closeups below). All units are carefully engineered for quick installation with a clean, neat, light-tight fit.

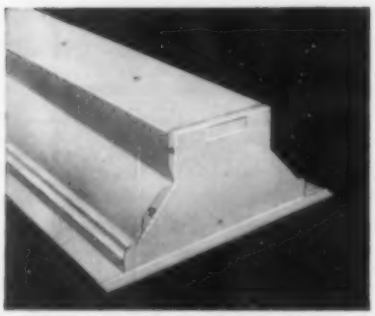
Both one-foot and two-foot widths measure only 5½" from top to bottom—slicing inches off old depths yet providing full illumination efficiency and needed heat dispersion. In many cases, no additional plenum depth is needed for mounting. Units are fully recessed. Latches and hinges don't show . . . only the clean lines of the outer framing and shielding.

In short, the Sylvania Shallow Troffer Series has a unique ability to meet many of the latest architectural requirements. It gives the creative lighting designer a new opportunity for freedom of expression, a medium for more effectively translating original decorative concepts into realities.

Lay-in type troffers are now provided for Z-spline and inverted-T ceilings. Exclusive *snap-up hanger* provides quick, secure mounting for most other types of acoustical ceilings. Contact your Sylvania Fixtures Specialist for further details. Or write to Lighting Headquarters for folder V-700 with complete specification data.

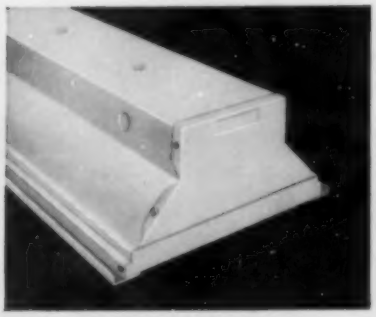
SYLVANIA ELECTRIC PRODUCTS INC.
Dept. K30, Lighting Division—Fixtures
One 48th Street, Wheeling, W. Va.

All it takes are these 3 Sylvania housing types



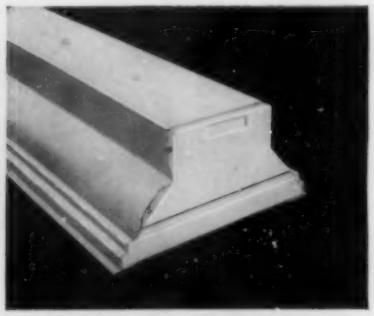
Exposed Flange Housing

For most acoustical tile and plaster ceilings. For appearance, wide side flanges and flange-type end caps trim the ceiling opening. Choice of Snap-Up Hanger, Hanger-Strap, or End-Support Bracket Mounting, depending on ceiling type.



Fit-In Flange Housing

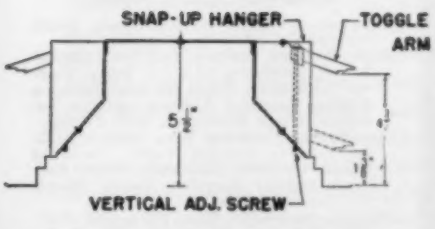
For use with metal pan acoustical ceilings. Has straight ends for proper functioning of metal pans. To facilitate installation, turned-up lips do not actually engage in the T-bar, but *do* provide appearance of complementing metal pan.



Concealed Flange Housing

For inverted T-grid acoustical ceilings. Used with Inverted-T acoustical ceilings or exposed Z-Splines running parallel to troffers, it always employs Lay-In mounting. Narrow side flanges, "cut-back" ends fit modular ceiling dimensions.

New Sylvania 2′ Wide Troffers—only 5½" deep—used with suspended ceiling system for combined eye-interest and good lighting. Shown; the new offices of Hagan Chemicals & Controls, Inc., Parkway West, Pittsburgh, Pa.



5½" high troffers utilize full plenum space

Exclusive new Snap-Up Hanger eliminates wasted plenum depth; toggle springs out, rests on ceiling supports when fixture is pushed into position. Leveling is accomplished with adjusting screw.

Easy access cuts maintenance time, costs

Simple push upward releases hidden latch. Concealed hinging swings shielding down, holds it throughout cleaning and lamp changes. Each fixture is individually fused.

Sylvania's standard troffer shieldings include—

Corning #71 Crystopal Flat Glass Lens
Corning Flat Albalite (diffuse opal glass)
Skytex
Patterned Clear Plastic Lens
Dished Acrylic Plastic (diffuse panel)
Plastic Louver—43° x 43°
Metal Louver—35°C x 45°L
Metal Louver—45°C x 45°L

Other shielding types will be provided on request.

Best fixture value in every price range

SYLVANIA

Fluorescent Lighting Fixtures and Systems

LIGHTING • TELEVISION • RADIO • ELECTRONICS • PHOTOGRAPHY • ATOMIC ENERGY • CHEMISTRY-METALLURGY

Next year's Presidential Couple, at right, with Beverly Travis, RVP for Pacific Northwest.

G. Frank Dean, Joe Bateman.

Teen-agers (67 of them at Toronto) had a ball. This shot, a teen party Tuesday, with real jivey records and Coca Cola flowing like wine.

Power behind the throne. Caught at a ladies' luncheon are Mrs. Carl (RVP) Wilson Mrs. James (General Secretary) Chambers, Mrs. Kirk (retiring President) Reid, Mrs. Joseph (First VP) Browder, Mrs. Richard (Second VP) Slauer and Mrs. George (President) Taylor.

(*Continued from page* 19A)

8. Visionics Field Laboratory: B. Goldberg, R. S. Wiseman, Research and Development Laboratories, Fort Belvoir, Va.
9. Automated Universal Distribution Photometer:* J. S. Franklin, General Electric Co., Hendersonville, N. C.
10. Automatic Photometer for Street Lighting and Other Luminaires:* G. A. Horton, R. C. Speck, Cleveland, Ohio, and P. A. Zaphyr, R. E. Wendt, East Pittsburgh, Pa., all of Westinghouse Electric Corp.

August 19
Research Session (Parallel)

Chairman — Benjamin S. Benson, Jr., Benjamin Electric Corp., Des Plaines, Ill.
Discussion Organizer — Willard Allphin, Sylvania Electric Products, Inc., Salem, Mass.
11. A Discomfort Glare Evaluator:* S. K. Guth, J. F. McNelis, General Electric Co., Nela Park, Cleveland, Ohio.
12. A Study of Glare from Very Large Sources: R. G. Hopkinson, Building Research Station, Watford, Herts, England, and R. G. Bradley, Cornell University, Ithaca N. Y.
30. Recent Visual Data as a Basis for Recommended Footcandle Levels: H. R. Blackwell, Director, Vision Research Laboratories, University of Michigan, Ann Arbor, Mich.
13. Computation of Relative Comfort and Relative Visibility Factor Ratings for Roadway Lighting:* Charles H. Rex, General Electric Co., Hendersonville, N. C.

Residence Lighting Forum

Chairman — Virginia Skinner, Long Island Lighting Co., Hicksville, N. Y.
Keys to More Exciting Interiors: Eleanor Brown, Decorating Lecturer, Robert Simpson Co., Toronto. Peggy Lidstone, Residence Lighting Specialist, Lighting Institute, Canadian General Electric Co., Ltd., Toronto.
Keys to More Beautiful Home Grounds: Ashley Norcross, Director, Garden Center of Greater Cleveland, Ohio. Mary Webber, Residence Lighting Specialist, General Electric Co., Cleveland, Ohio.
Keys to Dimming — Why, When, and How: William P. Carpenter, Superior Electric Co., Bristol, Conn.

Light Sources Session (Parallel)

Chairman — Floyd W. Sell, Detroit Edison Co., Detroit, Mich.
Discussion Organizer — G. A. Freeman, Westinghouse Electric Corp., Bloomfield, N. J.
14. Self-Ballasted Vapor Lamps; New Basic Design Data and New Improved Types: H. S. Strauss. W. E. Thouret, Duro-Test Corp., North Bergen, N. J.
15. Measurement of Mercury Lamp Current Crest Factor and Its Effect on Lumen Main-

(*Continued on page* 25A)

"One Gob at a time..."

But there's more to that "Gob" than meets the eye. When it has been properly pressed, hardened, cooled, annealed and inspected—a piece of glass is ready for delivery. Actually, it's more than a piece of glass—*it's a finished engineering service.*

Say a man walks into our offices (or calls or writes us a letter) and says, "I want a glass lens or filter for such and such an application. It must have certain physical dimensions, light transmission and distribution, color characteristics, etc., etc."

What do we do? Our engineers design a glass that will meet these specifications *exactly.* This involves developing a formula of the actual ingredients, engineering the molds in which the "gobs" are pressed to proper size and shape, and establishing rigidly-controlled manufacturing procedures.

And that's how Kopp Glass has engineered—*to specific user requirements*—over 1000 different types of technical glass items. It's a highly-specialized method of producing relatively small production quantities of custom-made products.

Call or write us *today,* about your particular application. You can depend on Kopp's long experience in glass technology, manufacturing facilities and know-how, modern research laboratories, and trained engineers and craftsmen to come up with the exact glass or lenses to meet your needs.

We'll be happy to send you descriptive literature.

KOPP GLASS

SPECIALISTS IN TECHNICAL GLASS

Kopp Glass INC.

SWISSVALE, PENNSYLVANIA

In Conventional Dress or "Sack"...

Milady Appears to Best Advantage Under **LITECONTROL** *Lighting*

What's the "price tag" on quality lighting like that above? Very reasonable because the installation features *standard* Litecontrol fixtures.

The luminous ceiling uses Holophane No. 6024 acrylic lenses which provide approximately 100 foot-candles of extremely comfortable and flattering illumination — with shadows reduced to a minimum. (The round downlites were supplied by others.) The moderate cost of the lens ceiling is further reduced and offset by the fact that the fixture occupies a considerable area which would otherwise require new ceiling material. The owners and store personnel are enthusiastic about the lighting and rightfully proud of their smart-looking premises.

Right now there are architects and contractors making other property owners enthusiastic with Litecontrol illumination on a sensible budget. *Be one of them — it pays!*

INSTALLATION: George H. Kimball, Inc., Portsmouth, N. H.

TYPE OF AREA: Ladies' Apparel Store

STORE DESIGNER: Hermadorf Fixture Mfg. Co., Manchester, N. H.

DISTRIBUTOR: Dyer-Clark Co., Lawrence, Mass.

ELECTRICAL CONTRACTOR: Walter B. Redden, Portsmouth, N. H.

FIXTURES:
Litecontrol luminous lens ceiling, 8' x 48', using Holophane 16024 lenses —lamps on 24" centers

INTENSITY: Average 100 foot-candles in service

LITECONTROL

Fixtures

KEEP UPKEEP DOWN

LITECONTROL CORPORATION,

36 Pleasant Street, Watertown 72, Massachusetts

DESIGNERS, ENGINEERS AND MANUFACTURERS OF FLUORESCENT LIGHTING EQUIPMENT DISTRIBUTED ONLY THROUGH ACCREDITED WHOLESALERS

(*Continued from page 22A*)

tenance:* E. C. Martt, R. J. Smith, General Electric Co., Nela Park, Cleveland, Ohio.

16. Effects of High Operating Temperature on the Lamp Envelope: F. A. Loughridge, Sylvania Electric Products Inc., Salem, Mass.
17. Circuits for Short-Arc Lamps: T. C. Retzer, Westinghouse Electric Corp., Bloomfield, N. J.
18. New Combustible for Photoflash Lamps:* L. F. Anderson, Sylvania Electric Products Inc., Montoursville, Pa.
19. An Internal Optics Projection Lamp: J. M. Harris, Sylvania Electric Products Inc., Salem, Mass.

Calculations Session (Parallel)

Chairman — J. M. Chorlton, Board of Education, Toronto.
Discussion Organizer — J. J. Neidhart, The Miller Co., Meriden, Conn.

20. Controlled Fluorescent Reflector Design for Sharp Cut-Off and Uniform Distribution: Domina E. Spencer, University of Connecticut, Storrs, Conn.
21. A Versatile Method of Calculating Illumination and Brightness:* Bill F. Jones, Smoot-Holman Co., Inglewood, Calif. and J. Roy Jones, Westinghouse Electric Corp., Los Angeles, Calif.
22. Predetermination of Luminances by Finite Difference Equations:* James A. Howard, Philip F. O'Brien, Dept. of Engineering, University of California, Los Angeles, Calif.

Progress Report: Chairman, E. A. Linsday, General Electric Co., Nela Park, Cleveland, Ohio.

August 20
My Most Interesting Lighting Job Contest

CLASS I — RESIDENCE LIGHTING
Presiding — L. E. Tayler, Detroit Edison Co., Detroit, Mich.
Judges—W. A. Dalrymple, Margaret Lidstone, Joseph Thomas.
Regional Winners
East Central — Miss Elizabeth Meehan, Philadelphia Electric Co., Philadelphia, Pa. "Lighting of Model Homes"
Great Lakes — Martin D. Klein and Mrs. Lucille Hanratty, General Electric Co., Nela Park, Cleveland, Ohio.
Inter-Mountain — F. H. Rosenquist, Public Service Co. of Colorado, Denver, Colo. "The Home on Buffalo Ridge"
Midwestern—William Kuhnke, Wisconsin Electric Power Co., Milwaukee, Wis. "Lighting As You Like It"

Retiring Council members were presented with Certificates of Appreciation. Concluding their terms are l. to r., C. L. Thompson, South Pacific Coast RVP; Brooks Chassaing, Director; J. A. Schneller, Midwestern RVP; George Morris, South Central RVP. Kirk Reid, right, made the presentations.

Mr. and Mrs. G. W. (Shorty) Beals, at a party celebrating his retirement.

VIP's of the CIE. L. E. Barbrow, U. S. National Committee Secretary; Willard Brown, Vice-Pres.; A. A. Brainerd, Executive Sub-Committee; and H. H. Magdsick, President of U. S. Committee.

Northeastern—Sylvan R. Shemitz, New Haven Electric Supply Co., New Haven, Conn. "Lighting an Oak View Home"
Pacific Northwest — Mrs. Grace Shoeni, Portland General Electric Co., Portland, Oregon. "1957 Idea Home"
South Pacific Coast — J. Grant Florin, Southern California Edison Co., Huntington Beach, Calif. "Residential Interior and Floodlighting"
Southeastern — Miss Marguerite Borelli, Oklahoma Gas and Electric Co., Oklahoma City, Okla. "1957 Electric-Living Home"
Canadian — Norman W. Bethune, C. & M. Products Ltd., Scarborough, Ont.

CLASS II — COMMERCIAL, INDUSTRIAL AND OTHER
Presiding — C. W. McCormick, Connecticut Light and Power Co., Hartford, Conn.
Judges — Joseph Browder, Duncan Jones, Carter Lewis, J. Carl Wilson.
Regional Winners
East Central — G. William Wagner, Philadelphia Electric Co., Philadelphia, Pa. "Lighting Swann Memorial Fountain"
Great Lakes — Clifford Crookes, Toledo Edison Co., Toledo, Ohio. "Home Building and Savings Bank"
Inter-Mountain — Norman Winchester, Independent Testing Laboratories, Boulder, Colo. "Lighting a Galvanometer"
Midwestern — Melvin Cohen, A. Epstein and Sons Inc., Chicago, Ill. "Radfei Zedek Synagogue"
Northeastern — Noel S. Florence, Lightolier Co., New York, N. Y. "House of Seagrams"
Pacific Northwest — A. G. Drapes, Drapes Engineering Co., Great Falls, Mont. "Lighting a Health and Physical Education Center."
South Pacific Coast — Jack L. Gates, Southern California Edison Co., Fullerton, Calif. "Lighting an Inspection Booth"
South Central — James F. Fletcher, Flinn, Fletcher Humphrey Inc., Memphis, Tenn. "Lighting a Stained Glass Window"
Southeastern — Coy C. Jordan, Carolina Power and Light Co., Raleigh, N. C. "Bank of Farmville," and R. E. Faucett, General Electric Co., Hendersonville, N. C. "Lighting a Mountain Mansion"
Southwestern — Leslie Hamilton, George L. Dahl Co., Dallas, Texas. "Dallas Memorial Auditorium"
Canadian — George T. Watson, Amalgamated Electric Corp., Toronto, Ont. "Bank of Commerce — Floodlighting"

(*Continued on page 26A*)

(*Continued from page 25A*)

Breakfast together each day of the Conference made solid friends for the 262 ladies present.

San Francisco in '59. This group of members from California extended a welcome to Toronto delegates (and all others) to next year's conference.

August 21
Light Sources and Applications Session (Parallel)

Chairman — T. C. Sargent, Sylvania Electric Products Inc., Salem, Mass.
Discussion Organizer — W. P. Beazley, Northern Electric Co. Ltd., Montreal, Que.

23. Design of Fluorescent Lamps for High Frequency Service:* G. A. Meyers, F. M. W. Strojny, Sylvania Electric Products Inc., Danvers, Mass.
26. Influence of Electrode Materials on Fluorescent Lamp Discoloration:* A. W. Wainio, F. M. Craven, Westinghouse Electric Corp., Bloomfield, N. J.
37. Mercury and Fluorescent Team Up for Industry: Morgan Christensen, Quentin D. Dobras, General Electric Co., Nela Park, Cleveland, Ohio.
35. Outdoor Applications of New Reflector Contour Designs for Higher Output Fluorescent Lamps: S. C. Peck, J. P. Keenan, Sylvania Electric Products Inc., Salem, Mass.

Daylighting Session (Parallel)

Chairman — J. W. Griffith, Southern Methodist University, Dallas, Texas.
Discussion Organizer — R. W. McKinley, Pittsburgh Plate Glass Co., Pittsburgh, Pa.

27. Efficiency of Domed Acrylic Skylights: E. M. Linforth, Rohm and Haas, Philadelphia, Pa.
28. Brightness Survey of Two Rooms Using a Photographic Technique: M. N. Zeolla, Pittsburgh Plate Glass Co., Creighton, Pa.
29. Analogue and Digital Computer Solutions of Daylighting Problems:* P. F. O'Brien, James A. Howard, University of California, Los Angeles, Calif.

Street Lighting Session (Parallel)

Chairman — D. W. Bowten, Westinghouse Electric Corp., Cleveland, Ohio.
Discussion Organizer — T. J. Seburn, Bureau of Highway Traffic, Yale University, New Haven, Conn.

31. Theoretical and Practical Light Distributions for Roadway Lighting:* A. W. Fowle, R. L. Kaercher, Holophane Co., Newark, Ohio.
32. Highway Lighting Without Glare — A New Lighting Technique: W. M. Waldbauer, Westinghouse Electric Corp., Cleveland, Ohio.
33. A Demonstration Laboratory for Outdoor Roadway Lighting: R. M. Swetland and K. D. Tobin, General Electric Co., Hendersonville, N. C.

(*Continued on page 28A*)

Outgoing Pres. Reid, left, receives memento of his administration — framed grouping of his Council 1957-1958 members — from incoming George Taylor.

Maritime's members at Toronto l. to r. Doug MacMackin, George Robinson, Roly Webb and Mrs. Webb, and Wilf McElman, incoming Maritime Chairman.

NEW...from APPLETON

24" High-Bay Mercury Vapor Lighting Units

higher production . . . fewer rejects . . . improved employee relations . . . extended safety records

more effective illumination at the work level!

Here is a precision-designed lighting unit for large industrial interiors and high-bay plant areas. High illumination levels without uncomfortable glare... Ventilated hood for lower operating temperature and minimum dirt accumulation... the new APPLETON 24" High-Bay Mercury Vapor Lighting Unit is a unique combination of technical features which give you more useable illumination at the work level. Available in: 1 pc. socket type construction or with the 2 pc. APPLETON DISKONECT time-saving maintenance feature. (Permits both lamp and reflector to be removed as a complete unit without disturbing wiring!) Reflecting surfaces are of ALZAK* processed aluminum. Available for concentrating or spread-type illumination distribution. For use with 1,000 Watt Mercury Vapor Lamps, this new APPLETON 24" High-Bay Mercury Vapor Lighting Unit is designed to meet your specific needs. As with all APPLETON Industrial Lighting Products... you can *see* the difference!

*A proprietary term of Aluminum Company of America

Sold Through Franchised Distributors Only

APPLETON ELECTRIC COMPANY
1701 Wellington Avenue, Chicago 13

Also Manufacturers of:

"ST" Series Connectors

Outlet Boxes

Malleable Iron Unilet Fittings

Reelites

Lee Tayler, Carl Egeler.

(*Continued from page* 26A)

34. A High Utilization Fluorescent Street Lighting Luminaire — Its Design and Evaluation:* D. E. Husby, Westinghouse Electric Corp., Cleveland, Ohio.

Applications Session (Parallel)

Chairman — S. K. Guth, General Electric Co., Cleveland, Ohio.

Discussion Organizer — Francis Clark, Lighting Services, Waterbury, Conn.

36. Maintenance Factors and Features of Industrial Fluorescent Luminaires: George J. Taylor, New York, N. Y., and R. D. Bradley, St. Louis, Day-Brite Lighting Inc.

38. Integrated Ceilings for Illumination: J. S. Hamel, Consulting Engineer, Burbank, Calif.

39. Some Possibilities for Enrichment of Luminous Ceilings: Gyorgy Kepes, R. O. Preusser, Massachusetts Institute of Technology, D. E. Spencer, University of Connecticut, and L. F. Martin, Marlux Corp., Billerica, Mass.

40. Light Directing Versus Diffusing Media in Luminous Ceiling Areas: H. A. Odle, R. L. Smith, Holophane Co. Inc., Newark, Ohio.

Closing Session

Presiding, C. L. Amick, Chairman, National Technical Conference Committee.

President's Reception and Banquet—Presiding, J. W. Bateman, Chairman, Conference Executive Committee.

1958 Conference Executive Committee

Chairman, J. W. Bateman, Canadian General Electric Co. Ltd.
Vice-Chairman and Treasurer, G. F. Dean
Secretary, G. E. Davidson

Entertainment
W. L. Hawley — Chairman

Reception and Banquet
L. R. Nordby, Chairman — K. R. Ormrod
R. A. Yates — J. D. Mullock

Transportation
E. F. Wilson, Chairman — L. E. Sandiford
H. R. Nellis — S. W. McKnight

Sports
G. E. Wallace, Chairman
J. R. McGovern — R. E. Anderson

Publicity
Chairman — W. A. Dalrymple
Printing — F. G. Reed
Local Publicity — R. W. Sclater
Attendance and Advance Publicity — D. M. Jones

Hotel
Chairman — E. I. Machtinger

Reservations
I. D. Smith, Chairman
A. J. Brown — K. Tate

Decorations and Display
Chairman — R. C. Allison
T. D. Dowding

Meeting Rooms and Facilities
N. H. Scott, Chairman — W. Burch
W. Pringle — F. E. Barker

Registration
Chairman — R. P. Lindsay

R. G. Jacques — A. W. Henschel
N. A. Bethune — E. J. Bartley
J. D. Harrison — R. H. Fell

National Technical Conference Committee
Chairman — C. L. Amick

J. W. Bateman — J. D. Mitchell
J. B. Browder — A. C. Sangster
Brooks Chassaing — J. A. Schneller
H. F. Davidson — J. S. Schuchert
J. C. Forbes — C. C. Shotwell
R. K. Lothrop — C. M. Thompson
W. P. Lowell, Jr. — J. S. Walsh
C. W. McCormick — J. C. Wilson

Gold Medalists of I.E.S.

1944 . . . George H. Stickney
1945 . . . Preston S. Millar
1946 . . . E. C. Crittenden
1947 . . . Matthew Luckiesh
1948 . . . Sir Clifford Paterson
1949 . . . Ward Harrison
1950 . . . W. F. Little
1952 . . . H. H. Magdsick
1954 . . . E. F. Lowry
1955 . . . J. L. Stair
1956 . . . George S. Crampton
1957 . . . John O. Kraehenbuehl
1958 . . . C. A. B. Halvorson

Papers Committee
Chairman — H. F. Davidson
Vice-Chairman — F. W. Sell

L. E. Barbrow — B. S. Benson, Jr.
R. L. Biesele, Jr. — F. C. Breckenridge
J. L. Cox — Kurt Franck
O. B. Goldsmith — S. K. Guth
T. C. Sargent — G. A. Trosper
G. P. Wakefield

Progress Committee
Chairman — E. A. Linsday

R. C. Allison — A. R. Jaeger
H. A. Anderson — W. S. Kolb
E. W. Beggs — F. J. Marriett
L. R. Bush — J. H. McCulloch
J. T. Chambers — T. C. Sargent
R. E. Faucett — M. K. Strang
B. Goldberg — R. P. Teele
John Cornet — M. L. Trostle
E. A. Altree — H. A. Williams

Lighting Service Committee
Chairman — C. W. McCormick

H. A. Anderson — Carter Lewis
Robert Babcock — L. E. Tayler
Walter Ball — J. Thomas
A. C. Brodeur, Jr. — C. M. Thompson
Berlon C. Cooper — C. E. Waldron

(*Lighting News continued on page* 31A)

Gold Medal Acceptance Address

By C. A. B. Halvorson

Mr. President, Officers of the Society,
Ladies and Gentlemen:

I think you appreciate how happy I am to receive the I.E.S. Gold Medal. As many of you know, I have been engaged in the practice of street lighting design, of floodlighting design and related fields since 1898, sixty years ago. It is needless for me to remind you of the great changes that have taken place in the industry over this period. These changes in the industry, but even more important in the field in which you and I are most interested have been, I feel, important to the state of our civilization in our countries.

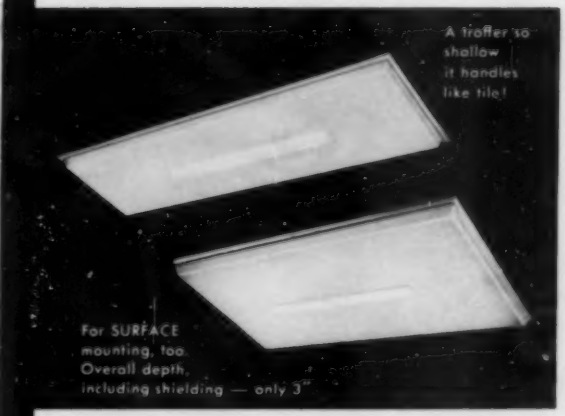
It is nice to feel that one has taken part in this great endeavor to the extent of receiving this recognition. It leaves one humble, but grateful. I am proud to be counted with the recipients of this medal, individuals whom I have respected and admired for their devotion and accomplishments to the art of illumination.

Sixty years of study and practice in our field leads me to an observation that I hope will prove of interest and possibly of value to all of us, and that includes myself, as a guiding principle to be followed in striving for improvements in the street lighting field.

The equipment now available is of course not the last word; however, it places in the hands of practicing engineers the tools to provide illumination that meets the aims of our society. It is my hope that the illuminating engineer of today and tomorrow will look upon the equipment that has been provided for use in constructing lighting installations, both in the street lighting field and in all other fields, as an artist looks upon his paint and brushes — to secure and provide a finished product that is not only utilitarian but adds to the aesthetic effect of the area to be illuminated. Only in this way can we fulfill the possibilities in the field of illumination. To this end I recommend your study and consideration in the future.

NEW Smithcraft SLENDEX

breaks the ceiling space barrier



SLENDEX solves tough ceiling problems . . . in acute ceiling space conditions . . . in low ceilings . . . in minimum cavities. Recesses only 1⅜" . . . SLENDEX is so shallow it handles like tile! Slender, sleek architectural styling is complemented by unique engineering features. Requires no extra depth for tilting . . . goes into the ceiling *flat*. Simplified installation and maintenance. Clean uniform lighting . . . no dark center streaks. Now — simplify your lighting job by using the new Smithcraft SLENDEX!

ADAPTS TO ALL COMMON CEILING TYPES

Inverted "T" grid systems
T-bar ceiling with snap-in metal pans
Plaster ceilings supported by wood furring
Soft tile ceilings with Z-spline, nail lock, or similar devices.

***BREAKS THE CEILING SPACE BARRIER!** 100 SLENDEX 2' x 4' units, selected from the offerings of 14 manufacturers, installed in the testing laboratory of one of the nation's largest steel companies. Ceiling 7'6" at lowest point; 1½" cavity depth.*

Write today for the complete Smithcraft Catalog, your buying guide to "America's finest fluorescent lighting."

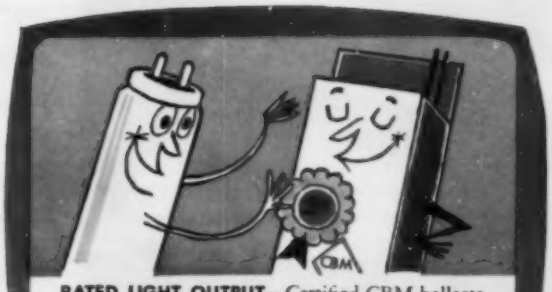
Smithcraft
LIGHTING
CHELSEA 50, MASSACHUSETTS

BEFORE YOU CHOOSE LIGHTING ...get this free booklet!

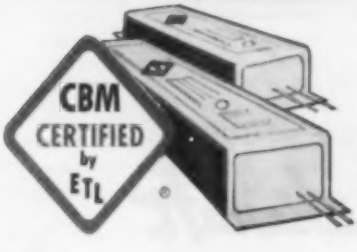
CBM
How Fluorescent Lamp Ballasts that bear this Emblem insure your Lighting Investment
CBM CERTIFIED by ETL
CERTIFIED BALLAST MANUFACTURERS
Tells how CBM protects you on these and other pay-off factors...
CBM

BALLAST LIFE—Certified CBM ballasts are tested for temperature . . . must confine to set limits, as overheating drastically cuts ballast life.

QUIET OPERATION—CBM specifications require a ballast to be well-designed mechanically and electrically, so that it will operate quietly and not create objectionable noise.



RATED LIGHT OUTPUT—Certified CBM ballasts are "tailored to the tube" . . . assure rated light output, steady light, peak lighting performance.



Send for this free booklet and learn how these factors and 11 others help insure your lighting investment when you buy fixtures equipped with Certified CBM ballasts.

CERTIFIED BALLAST MANUFACTURERS

2116 KEITH BUILDING • CLEVELAND 15, OHIO

Participation in CBM is open to any manufacturer who wishes to qualify

CBM-4-U

(*Lighting News continued from page 28A*)

Council Grants Charters To Yosemite, Arrowhead Chapters

Two new IES Chapters were chartered by favorable action of Council on their petitions at the August 22nd Council meeting in Toronto. Yosemite Chapter in Fresno, Calif., South Pacific Coast Region, is number 83, with the Golden Gate Section as the parent group. Officers of this new Chapter are: Irwin McMath, Pacific Gas & Electric, Fresno, Chairman; Lawrence H. Barre, Pacific Gas & Electric, Vice-Chairman, and Edward F. Bowen, City of Fresno, Secretary.

The Arrowhead Chapter at Riverside, Calif., number 84, was granted a charter contingent upon completion of membership requirements. This group developed in the area formerly encompassed by the Southern California Section, Los Angeles.

Both petitions were presented to Council by Carleton M. Thompson, South Pacific Coast Regional Vice-President.

Schneller, Deck Appointed To Fill Council Vacancies

Two vacancies which had developed on Council were filled by action of Council at its meeting in Toronto on August 22.

With one year remaining in his term as Director, A. L. Sangster, Detroit Edison Co., has found it necessary to resign from Council. To serve as Director to September 30, 1959, Council appointed Joseph A. Schneller, Quadrangle Manufacturing Co., Chicago.

John B. Deck, Jr., Texas Power and Light Co., Dallas, was appointed Regional Vice-President for the Southwestern Region to serve also to September 30, 1959. Mr. Deck fills the vacancy left by Reuben K. Lothrop who resigned as Regional V-P for reasons of ill health and is since deceased.

San Francisco Section Busy With Plans for '59 Conference

Plans for the 1959 National Technical Conference of the Illuminating Engineering Society were well underway even before the 1958 conference in Toronto. Energetic John S. Walsh, Pacific Gas and Electric Co., general convention chairman, lost no time after his own appointment to begin appointing committees and starting the preliminaries necessary for the staging of an outstanding conference in San Francisco next year. Like the joint chiefs of staff, Walsh immediately called staff meetings. Assignments were given. Some of the preliminaries are already underway.

First order of business was to make a display at the National Technical Conference at Toronto. This was placed in the hands of S. O. Blois, Pacific Gas and Electric Co., chairman of lighting and decoration. With that conference over, other meetings are scheduled.

To assist in two phases of the conference, Walsh appointed Arthur S. Tylor, Corning Glass Works, as operations vice-chairman, and William L. Friend, Sylvania Electric Products Inc., as program vice-chairman. Other committee chairmen are: finance, Charles Buchanan, Fluorescent Fixtures of California; papers, Gilbert A. Trosper, Pacific Gas and Electric Co.; hotel, George Baker, Graybar Electric Co.; registration, James H. Burson, Westinghouse Electric Corp.; audio-visual, Charles W. Macy, Pacific Gas and Electric Co.; conference and committee rooms, R. A. D. Schwartz, United Lighting & Ceiling; lighting and decoration, S. O. Blois; reception, Donald D. Scarff, Lamp Division, General

(*Continued on page 32A*)

SCHEDULED EVENTS

October 19-24, 1958 — Society of Motion Picture and Television Engineers, Sheraton-Cadillac Hotel, Detroit, Mich.

October 20-24, 1958 — National Safety Council (46th National Safety Congress & Exposition), Chicago, Ill.

October 27-31, 1958 — American Institute of Electrical Engineers (Fall General Meeting), Pittsburgh, Pa.

November 10-14, 1958 — National Electrical Manufacturers Association (Annual Meeting), Traymore Hotel, Atlantic City, N. J.

November 17-21, 1958 — Eighth Annual Plastics Exposition and National Conference of the Society of the Plastics Industry, Inc., International Amphitheater, Chicago, Ill.

November 18-20, 1958 — American Standards Association (9th Annual Conference on Standards). Hotel Roosevelt, New York, N. Y.

December 11, 1958 — Council Meeting, Illuminating Engineering Society, New York, N. Y. Members are free to attend meetings of Council as guests.

January 19-22, 1959 — American Institute of Electrical Engineers (Winter General Meeting), New York, N. Y.

January 26-29, 1959 — Plant Maintenance and Engineering Show, Public Auditorium, Cleveland, Ohio.

February 8-14, 1959 — National Electrical Week.

February 12, 1959 — Council Meeting, Illuminating Engineering Society, New York, N. Y. Members are free to attend meetings of Council as guests.

March 1-4, 1959 — Second National Lighting Exposition, New York Coliseum, New York, N. Y.

March 1-4, 1959 — National Electric Sign Association, Morrison Hotel, Chicago, Ill.

March 24-26, 1959 — First Biennial Chicago Electrical Industry Show, Hotel Sherman, Chicago, Ill.

March 30 - April 1, 1959 — Chicago Electrical Industry Show, Hotel Sherman, Chicago, Ill.

April 2-3, 1959 — East Central Regional Conference, Lord Baltimore Hotel, Baltimore, Md.

April 22, 1959 — Council Meeting, Illuminating Engineering Society, Asheville, N. C. Members are free to attend meetings of Council as guests.

April 22-24, 1959—South Central and Southeastern Regional Conference, Grove Park Inn, Asheville, N. C.

May 3-8, 1959 — Society of Motion Picture and Television Engineers, The Fontainbleau, Miami Beach, Fla.

May 4-5, 1959 — Southwestern Regional Conference, Shamrock-Hilton Hotel, Houston, Tex.

May 6-8, 1959 — Midwestern Regional Conference, Pere Marquette Hotel, Peoria, Ill.

May 11-12, 1959 — Inter-Mountain Regional Conference, Continental Hotel, Denver, Colo.

May 24-29, 1959 — National Association of Electrical Distributors (51st Annual Convention), Conrad Hilton Hotel, Chicago, Ill.

May 26-30, 1959 — Pacific Northwest Regional Conference, Banff Springs Hotel, Banff, Alta.

June 4-5, 1959 — Northeastern Regional Conference, Curtis Hotel, Lenox, Mass.

June 11, 1959 — Council Meeting, Illuminating Engineering Society, New York, N. Y. Members are free to attend meetings of Council as guests.

June 11-12, 1959 — Canadian Regional Conference, Chateau Laurier, Ottawa, Ont.

June 22-23, 1959 — Great Lakes Regional Conference, Statler Hotel, Buffalo, N. Y.

June 22-26, 1959 — American Institute of Electrical Engineers, Summer and Pacific General Meeting, Seattle, Wash.

October 5-10, 1959 — Society of Motion Picture and Television Engineers, Hotel Statler, New York, N. Y.

October 12-14, 1959 — National Electronics Conference, Inc., Hotel Sherman, Chicago, Ill.

October 12-16, 1959 — American Institute of Electrical Engineers, Fall General Meeting, Chicago, Ill.

November 2-5, 1959 — Eleventh Exposition of the Air-Conditioning and Refrigeration Industry, Convention Hall, Atlantic City, N. J.

November 9-13, 1959 — National Electrical Manufacturers Association, Traymore Hotel, Atlantic City, N. J.

(Continued from page 31A)

Electric Co.; ladies program, Guy de Leuze, manufacturers' representative; entertainment, R. L. Sawyier, Jr., Pacific Gas and Electric Co.; attendance, William R. Major, Jr., Crouse-Hinds Co.; publicity, William A. Cyr, *Electrical West;* sports, Frank Duhme, Smoot-Holman Co.; transportation, Fred D. Benz, Jr., manufacturers' representative.

Negotiations are underway to provide a pre-conference or post-conference trip to the Hawaiian Islands for those who would like to extend their trip to the coast and make it a complete vacation tour.

Hotel arrangements are being made at the Hotel Fairmont on top of Nob Hill, San Francisco, and other accommodations are being arranged at the Mark Hopkins and the Huntington hotels. Preliminary plans also call for a ladies' tour of the wine country and a visit to one of California's famous wineries. Sports fans can be provided a deep-sea fishing trip by the sports committee.

As further details are developed, announcement will be made in ILLUMINATING ENGINEERING.

R. M. Swetland Concludes 35-Year Career With GE

R. M. Swetland, senior illuminating engineer in the General Electric Co. Outdoor Lighting Department, Hendersonville, N. C., has retired after more than 35 years of service to the company. Mr. Swetland joined GE in 1923, after graduation from Bucknell University, as a member of the company's Test Course.

R. M. Swetland

The following year he was assigned to the Illuminating Engineering Laboratory and devoted the remainder of his career to work in the outdoor lighting field.

An active member of IES, Mr. Swetland served as chairman of the Tunnels and Underpasses Subcommittee, and supervised preparation of the 1957 report, "Lighting Traffic Tunnels and Underpasses." He has also served on the Roadway Committee. Mr. Swetland was one of three GE consultants for a chapter on Street Lighting Systems in the Edison Electric Institute's recently issued "Underground Systems Reference Book" and has authored many technical articles, his most recent being, "A Demonstration Laboratory for Outdoor Roadway Lighting," presented at the 1958 National Technical Conference in Toronto.

Following retirement, Mr. Swetland plans to continue his work in street and highway lighting as an independent engineering consultant.

GENERAL staff meeting of committeemen for the 1959 National Technical Conference by the Golden Gate Section in San Francisco. Surrounding John S. Walsh, center, are committeemen, left to right standing, R. L. Sawyier, Jr., S. O. Blois, James Burson, Gilbert Trosper, George Baker, Fred Benz, Jr. and William R. Major. Seated, James Wrathall, Arthur Tylor, Frank Duhme, Walsh, Robert Schwartz, John Epperson, and Guy de Leuze, Golden Gate Chairman.

January 1 — Deadline for Gold Medal Nominations

Nominations for the 1959 IES Gold Medal must be received at Headquarters Office by January 1. The Medal, illumination's highest honor, is awarded "for the purpose of giving recognition to meritorious achievement which has conspicuously furthered the profession, art or knowledge of illuminating engineering." It is presented to the winner together with an appropriately embossed parchment certificate during ceremonies at the National Technical Conference of the Society.

Any member may make a nomination by sending to the General Secretary the name of a candidate deemed worthy of this honor. The field of accomplishment may be enginering, design, applied illumination, optics, ophthalmology, lighting research, education, or administration and management. Candidates need not be members of the Society or citizens of the United States or Canada to receive consideration for the award.

In deciding upon the Medalist, the Medal Award Committee gives consideration to candidates who have been nominated in previous years as well as to new nominees.

Mid-South Chapter Offers Fundamentals Course

The first lecture in the Mid-South Chapter's Lighting Fundamentals Course was held on Sept. 9 at the Southern College of Optometry. The 12-session course, ending on Nov. 25, will be held on Tuesday evenings from 7:30 to 9:30 at the college. Six dollars covers tuition and the four texts which will be used in the course: *The Westinghouse Lighting Handbook;* Sturrock and Staley, *Fundamentals of Light and Lighting,* General Electric Bulletin LD-2; *I.E.S. Recommended Practice for Office Lighting* and *Lighting for Show Windows and Open Front Stores,* General Electric Bulletin LS-158.

Program and speakers are:

September 9 — Lighting and Seeing — J. E. Clark, O.D., Southern College of Optometry.

September 16 — Physics of Light — R. L. Coker, O.D., Physics Dept., Southern College of Optometry.

September 23 — Color and Field Measurements — R. L. Coker.

September 30 — Light Sources — R. V. Rideneur, District Lamp Engineer, General Electric Co.

October 7 — Quantity and Quality of Lighting — M. E. Broom, Professor and Dean, Southern College of Optometry.

October 14 — Design of Lighting Systems — J. F. Fletcher, Consulting Electrical Engineer.

October 21 — Design of Lighting Systems II — J. F. Fletcher.

(Continued on page 34A)

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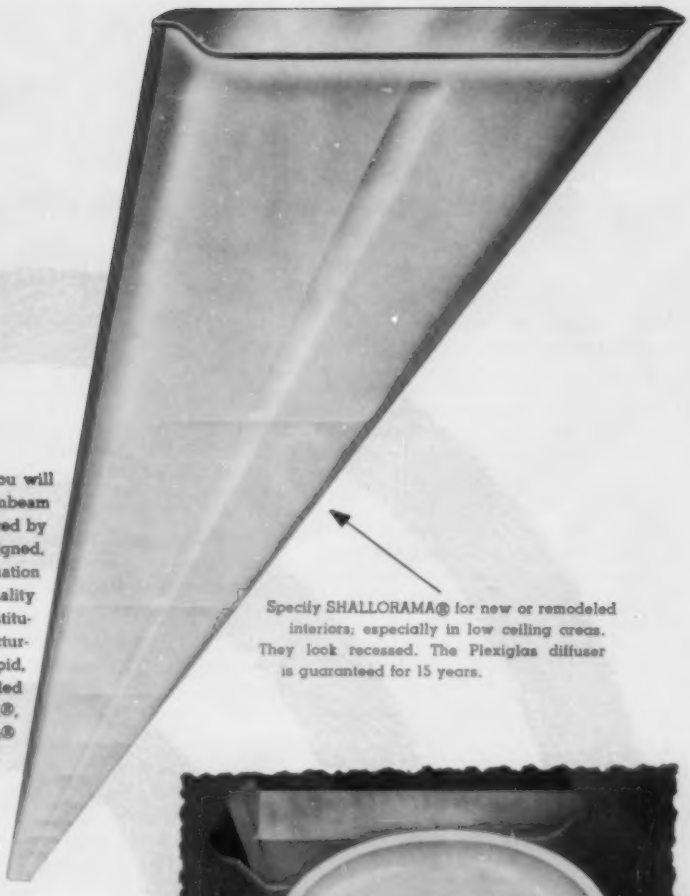
In your aim to obtain better lighting for better vision you will get a bull's-eye every time that you specify or select Sunbeam Lighting. Your chances of direct hits are greatly enhanced by the following factors: 1. All Sunbeam Visionaires® are designed, engineered and test-proven to produce specific illumination results. 2. You can choose from the largest line of quality luminaires in the country for almost every commercial, institutional and industrial application. 3. Two complete manufacturing facilities are strategically located to provide rapid, nation-wide deliveries. Typical of the many modernly styled and easy to install fixtures are the SHALLORAMA®, SIGHTLINE® and CSP3800 Visionaires®



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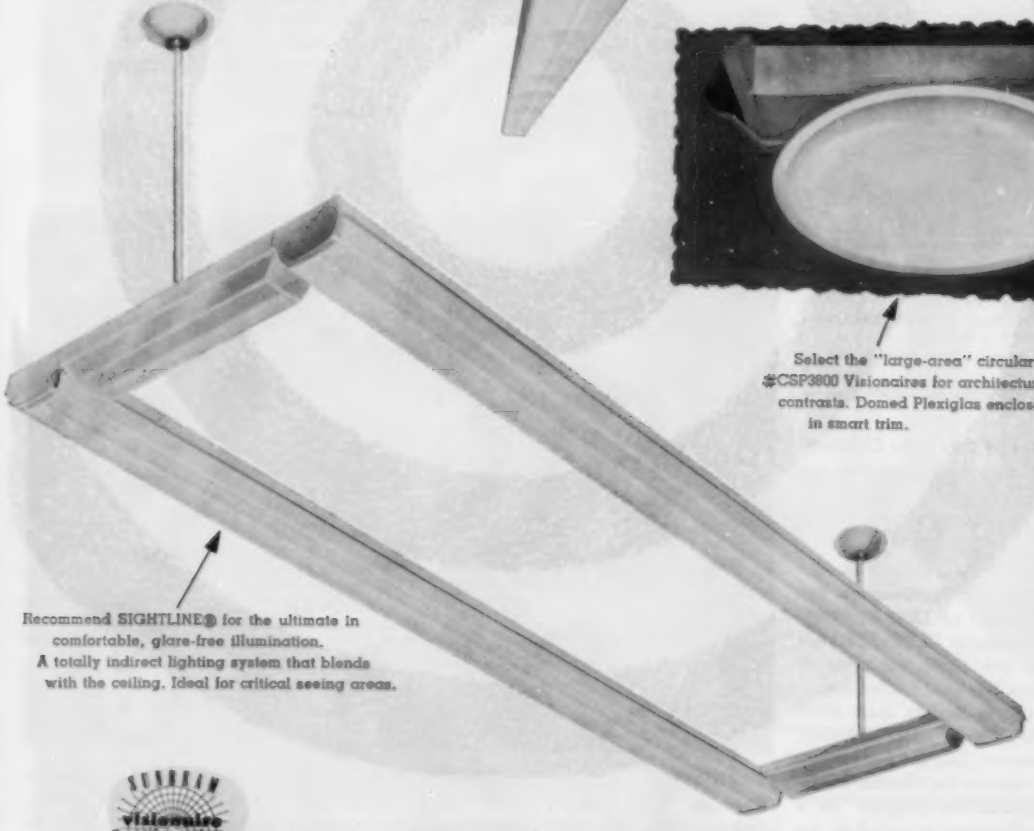

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(*Continued from page* 32A)

October 28 — Industrial Lighting — J. F. Fletcher.

November 4—Lighting Stores, Offices and Public Buildings — H. G. McMullen, Memphis Light, Gas & Water Division.

November 11 — Classroom Lighting — M. E. Broom.

November 18 — Residential Lighting — M. E. Broom.

November 25 — Street Lighting, Floodlighting and Sign Lighting, Airport Lighting, Sports Lighting and Lighting Costs — H. G. McMullen.

Annual Fundamentals Course Conducted by New York Section

The New York Section began its 12-week course in Fundamentals of Illumination on Sept. 22 at the Consolidated Edison Co. offices, 4 Irving Place, New York. Classes are held on Monday and Thursday evenings from 6:30 to 8:30 p.m. Tuition fee for the course is $15.00 for members of IES, AIA and AIEE and for employees of sustaining members; $20.00 for all others. Program and faculty is as follows:

September 22 — Theory of Light, Terminology and Measurements — H. Wald, Wald & Zigas.

September 29 — Light Sources I — Filament Lamps—R. E. Crockett General Electric Co.

October 6 — Light Sources II — Fluorescent Lamps — R. E. Crockett.

October 16 — Light Sources III — Fluorescent and Mercury — R. E. Crockett.

October 20 — Control of Light — Fixture Distributions and Systems — R. Wissoker, Day-Brite Lighting, Inc.

October 27 — Average Lumen Method of Calculating Footcandle Levels—L. Goren, Globe Lighting Products.

November 6 — Quantity and Quality of Illumination — R. Wissoker.

November 13 — Problem Practice Session — Incandescent and Mercury — N. Falk, Holophane Co., Inc.

November 17 — Problem Practice Session — Fluorescent — N. Falk.

November 24 — Problem Practice Session — Luminous Systems — L. Goren.

December 1 — Economics and Maintenance — H. Wald.

December 8 — Application in Installations — R. Wissoker.

R. S. Wissoker of Day-Brite Lighting, Inc. is acting as coordinator for the course.

Obituary

Reuben K. Lothrop, Southwestern Regional Vice-President of IES, died September 19 at the age of 54. Mr. Lothrop had become ill last April just prior to the Southwestern Regional Conference.

A member of the Society since 1937, Mr. Lothrop had been a Local Representative in Shreveport, La., for many years and, in 1954, became the Charter Chairman of the Ark-La-Tex Chapter. As a Regional Vice-President he served on the Regional Activities Committee and was also on the National Technical Conference Committee in 1957-1958. He was also active on the residential lighting committee of the Edison Electric Institute and on the utilities information committee of the Better-Light-Better-Sight Bureau.

Reuben K. Lothrop

Mr. Lothrop had been with the Southwestern Gas and Electric Co. since 1927. At the time of his death, he was lighting director for the company.

Annual Computer Conference Held in Philadelphia

The 1958 Eastern Joint Computer Conference, sponsored by the Association for Computing Machinery, the American Institute of Electrical Engineers and the Institute of Radio Engineers, was held Oct. 3-5 at the Bellevue Stratford Hotel, Philadelphia, Pa.

Papers were presented on modern system objectives, solid state computers, novel component design, automated system design, modern computer technology, data processing, artificial intelligence designs, application of simulated techniques, social science applications, preception and recognition designs, novel programming developments and proven business applications.

New Magazine For Electrical Field

Electrical Living, a digest-type quarterly directed toward the consumer, will begin publication in January 1959. Harry Restofski, recently-retired West Penn Power Co. Vice-President, is publisher of the new magazine, which will be distributed on a franchise basis by electric utilities. The editorial content of the publication will include reprints of articles from leading periodicals as well as staff-written material.

Mr. Restofski was prominent in many electrical industry activities during his 44-year career with West Penn Power, including Light's Diamond Jubilee, and the National Housepower campaign. He served as chairman of the EEI Commercial Division General Committee and Prize Awards Committee and is also well-known in IES circles. As publisher of *Electrical Living*, Mr. Restofski will have his offices at 777 Shady Drive East, Pittsburgh, Pa.

(*Lighting News continued on page* 46a)

TRADITION continues as C. E. Waldron (center), out-going Northeastern Regional Veep presents gavel from Edmonton Chapter to J. K. French (left), retiring Chairman of Yankee Chapter, the Society's next youngest group, while B. D. Barry, Jr., incoming Chapter Chairman, looks on. Presentation was made during the Yankee Chapter's summer outing in Lee, Mass.

POINT THE WAY

with NEW, PROJECTED LETTER

FLUORESCENT EXIT UNITS by PERFECLITE

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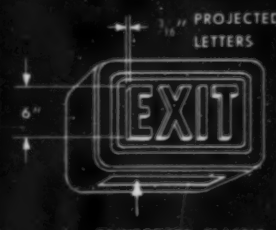

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Lucite faces available in 4 color combinations — with or without arrows. Completely wired for two T-5 6-watt lamps, 118-V. AC ballasts. Also available for use in 277-V. systems.

You reduce installation costs, make every building safer when you select Perfeclite unbreakable projected letter fluorescent exit signs. For further information, mail the attached coupon today!

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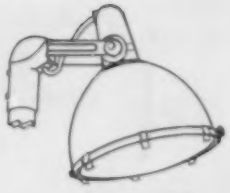
Revere Outdoor Lighting Report

Lighting an automobile sales lot

The Problem: To illuminate a long, deep sales area so that cars, signs, and buildings would attract attention and look more appealing to passers-by.

The Answer: Five poles, each mounting ten Revere No. 7403 *1000-watt* mercury floodlights on a No. 217-ZA bracket, were installed to provide the high level of lighting desired. Ten No. 3510-AL Revere Par Lamps are also mounted on each pole 10 feet above grade to highlight the color and beauty of the cars and create more sales appeal.



No. 7403 Floodlight

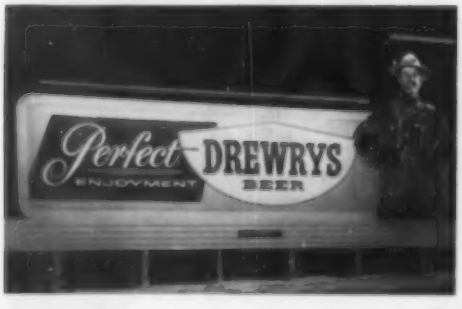
Lighting a city street

The Problem: To provide a lesser traveled secondary street with uniform, moderate-level lighting, in the most efficient, economical way possible.

The Answer: Revere Star-Lux incandescent street lighting luminaires were installed on converted concrete poles to provide efficient lighting at low cost. The Star-Lux uses up to 10,000 lumen incandescent lamps or 250 to 400-watt mercury lamps to provide any of the five standard A.S.A.-I.E.S. distribution patterns.

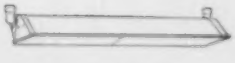
No. 2311-A/2363
Star-Lux Luminaire

Lighting a poster board



The Problem: To assure greater night visibility of an advertiser's poster board sales message by providing higher level, more uniform illumination.

The Answer: Revere Fluoresign outdoor luminaires with very high output fluorescent lamps were installed to give the high level of illumination desired. Reflector and lamp assembly may be positioned at any desired angle for uniform light distribution. Lamps give 10 times the rated life of incandescent types. Fixtures are unobtrusive, too.



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(Continued on page 38A)

(*Continued from page 37A*)

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Secretary — M. J. COTE, 1800 Bank St., Ottawa, Ont.

Ozark Chapter — Midwestern Region
Chairman — T. H. CONDON, City Utilities of Springfield, Mo., 301 East Central, Springfield, Mo.
Secretary — R. W. BARE, R. P. Stahl, Architect, 1465 S. Glenstone, Springfield, Mo.

Palmetto Section — Southeastern Region
Chairman — H. O. FELLERS, JR., Westinghouse Electric Supply Co., 915 Lady St., Columbia, S. C.
Secretary — R. E. FAUCETT, General Electric Co., Hendersonville, N. C.

Panhandle Chapter — Southwestern Region
Chairman — HAROLD W. POWELL, 107 Fairmont, Amarillo, Texas.
Secretary — GORDON L. BALDRY, P.O. Box 2492, Amarillo, Texas.

Philadelphia Section — East Central Region
Chairman — THOMAS G. BROUSSARD, Westinghouse Electric Corp., 3001 Walnut St., Philadelphia, Pa.
Secretary — EDWIN H. HENRIE, The Howard P. Foley Co., 1630 Pine St., Philadelphia, Pa.

Pittsburgh Section — East Central Region
Chairman — JOHN S. FRIZZELL, Pittsburgh Reflector Co., P.O. Box 432, Irwin, Pa.
Secretary — DONALD C. THOMAS, 124 Barbour Drive, Pittsburgh, Pa.

Puget Sound Section — Pacific Northwest Region
Chairman — ROBERT E. JONES, 444 Dexter Horton Bldg., Seattle, Wash.
Secretary — G. DON WIRT, Puget Sound Power & Light Co., 286 Fourth St., Bremerton, Wash.

Quebec Chapter — Canadian Region
Chairman — To be announced.
Secretary — To be announced.

Rochester Section — Great Lakes Region
Chairman — ALFRED G. ELLEY, Rowe Electric Supply Co., Inc., 255 East Ave., Rochester, N. Y.
Secretary — WILLIAM LOUDEN, Rochester Gas & Electric Corp., 89 East Ave., Rochester, N. Y.

Rocky Mountain Section — Inter-Mountain Region
Chairman — LLOYD S. REED, L. S. Reed & Co., 1018 Lawrence, Denver, Colo.
Secretary — JAMES E. WATSON, Fluorescent Maintenance Co., 1427 Elati St., Denver, Colo.

St. Louis Section — Midwestern Region
Chairman — CHARLES H. ZURHEIDE, Smith, Hanlon, Zurheide, Levy, Inc., 4010 Lindell Blvd., St. Louis, Mo.
Secretary — PAUL Q. OLSCHNER, Westinghouse Electric Corp., 410 N. 7th St., St. Louis, Mo.

St. Maurice Valley Chapter — Canadian Region
Chairman — PAUL GENDRON, P. A. Gouin Ltee., 71 des Forges St., Trois Rivieres, Que.
Secretary — JEAN-PAUL MORIN, Canadian Westinghouse Supply Co. Ltd., 3350 Royale St., Trois Rivieres, Que.

San Diego Section — South Pacific Coast Region
Chairman — R. W. ROHRBACK, 4626 Estrella Ave., San Diego, Calif.
Secretary — DAVID F. CURTIS, San Diego Gas & Electric Co., P.O. Box 1831, San Diego, Calif.

San Jacinto Section — Southwestern Region
Chairman — GEORGE H. SIMPSON, 5226 Mercer, Houston, Texas.
Secretary — D. L. COPELAND, Crouse-Hinds Co., 2801 San Jacinto St., Houston, Texas.

San Jose Chapter — South Pacific Coast Region
Chairman — REX GARDINER, Pacific Gas & Electric Co., 86 S. 3rd St., San Jose, Calif.
Secretary — PETER DARNTON, Pacific Gas & Electric Co., 161 Main St., Salinas, Calif.

Southeast Florida Section — Southeastern Region
Chairman — PAUL FOSTER, Foster Electric Co., 2264 W. Flager St., Miami, Fla.
Secretary — GEORGE H. GILL, Century Lighting Inc., 1477 N.E. 129 St., North Miami, Fla.

Southern California Section — South Pacific Coast Region
Chairman — FRANK B. LEE, General Electric Lamp Division, 2747 S. Malt Ave., Los Angeles, Calif.
Secretary — EDWARD BALOGH, 3814 Glendale Dr., Sherman Oaks, Calif.

Southern Colorado Chapter — Inter-Mountain Region
Chairman — WILLIAM STULTS, Southern Colorado Power Co., 613 Main St., Canon City, Colo.

(*Continued on page 46A*)

COMMITTEE PERSONNEL

COMMITTEES 1958-1959

All committees are appointed by the President, subject to approval of the Council. Except as provided in the Constitution, appointments terminate at the time of the first Council meeting of the following administration. The scope of each committee is indicated.

G. J. Taylor, President, ex-officio member of all Standing, General and Task Committees except Board of Fellows, Nomination and Medal Award.

J. B. Browder, Vice-President, ex-officio member of all Technical Committees.

STANDING COMMITTEES

COUNCIL EXECUTIVE — To conduct the affairs of the Society between Council meetings.

G. J. Taylor, Chairman, Day-Brite Lighting Inc., 161 East 42nd St., New York 17, N. Y.

J. B. Browder	G. F. Dean
J. R. Chambers	R. G. Slauer

BOARD OF FELLOWS — To evaluate the eligibility of candidates for transfer to grade of Fellow according to procedures approved by Council.

Edward Rambusch, Chairman, Rambusch Decorating Co., 40 West 13th St., New York 11, N. Y.

Willard Allphin	L. H. Brown
J. W. Bateman	J. S. Hamel
	B. J. Jensen

FINANCE — To have direct supervision of the financial affairs of the Society and to present to the Council an annual report on its financial condition. To make recommendations to the Council as to the investment of moneys and upon all specific appropriations. To prepare and submit for approval of Council not later than the first new Council meeting, a budget of income and expense for the ensuing fiscal year.

W. P. Lowell, Jr., Chairman, Sylvania Electric Products Inc., 60 Boston St., Salem, Mass.

A. C. Barr	G. F. Dean, ex-officio
H. S. Beagle	R. M. Zabel

GENERAL BOARD OF EXAMINERS — To investigate the qualifications of all applicants for admission to membership; to elect or reject applicants for the grade of Associate Member and Student Member, to report such action to the Council; and to make recommendations to the Council regarding applications for transfer or election to the grade of Member or Retired Member, and for transfer to the grade of Member Emeritus.

H. E. D'Andrade, Chairman, General Electric Co., Inc., 570 Lexington Ave., New York 22, N. Y.

S. W. Bruun	R. H. MacVean
B. S. Benson	J. W. Griffith
F. C. Breckenridge	S. K. Guth
James Cox	Ted Sargent
H. F. Davidson	G. A. Trosper
Kurt Franck	George Wakefield
O. B. Goldsmith	L. E. Barbrow
	R. S. Wiseman

PAPERS — To procure, review and approve all technical papers and discussions thereof, for presentation before National Conferences of the Society.

F. W. Sell, Chairman, Detroit Edison Co., 2000 Second Ave., Detroit, Mich.

PUBLICATIONS — To be responsible for the procurement, review and approval of all material for the publications of the Society other than technical papers approved by the Papers Committee for presentation at National Conferences of the Society and their discussions and committee reports, for which it will have publication responsibility only. Shall also be responsible for the editing, printing and business management of the publications of the Society; specific exceptions may be made by Council.

R. M. Zabel, Chairman, Westinghouse Electric Corp., Bloomfield, N. J.

Brooks Chassaing	R. W. Morris
Eve Freyer	J. S. Schuchert
W. P. Lowell, Jr.	F. W. Sell

GENERAL COMMITTEES

ADVANCE PLANNING — To study the long range objectives of the Society — its operation, program, publication activities, membership classifications and financial structure, and to make recommendations to Council.

J. Dixon Mitchell, Chairman, Westinghouse Electric Corp., 2260 Peachtree Industrial Blvd., Chamblee, Ga.

A. C. Barr	L. C. Twichell
W. P. Lowell, Jr.	J. D. Whitnell

ADVISORY BOARD TO THE PRESIDENT — To examine the organization, accomplishments, and assignments of committees and prepare not later than July 1 of each year a proposed list of committees and personnel; and to evaluate costs and benefits of present and proposed Society services.

J. B. Browder, Chairman, Georgia Power Co., 75 Marietta St. N. W., Atlanta 1, Ga.

J. R. Chambers	K. M. Reid
G. F. Dean	R. G. Slauer

ALLIED ARTS — To encourage and assist local competitions in allied arts, in cooperation with technical committees and interested local groups.

J. D. Whitnell, Chairman, Arizona Public Service Co., P. O. Box 2591, Phoenix, Ariz.

K. A. Staley, Secretary, General Electric Co., Nela Park Cleveland 12 Ohio.

Carl Albach	R. B. McFarland
D. J. Bourdon	Howard McKinley
R. W. Brown	Onnie Monkki
Roy Dahlin	M. B. Moore
John Flynn	Joseph Morbito
A. B. Gallion	Roy Palmer
Herbert Hoffman	Kenneth Parsons
A. R. Keeler	J. C. Penafeather
Lucien Kight	Harry Rodman
J. O. Kraehenbuehl	J. A. Russell
William Lam	B. J. Sabaroff
Thomas Mackesey	G. E. Shoemaker

BOARD OF NOMINATION — To prepare a nomination ticket containing the names of those who are deemed best suited to serve as officers and directors in positions to be filled at the ensuing election.

R. F. Hartenstein, Chairman, Ohio Edison Co., Akron, Ohio.

K. M. Reid	M. N. Waterman
	and regional representatives

CONSTITUTION AND PROCEDURES — To prepare proposed amendments to the Constitution and By-laws, to prepare statements of policies and procedures consistent with the Constitution and By-laws, and to report to Council.
R. F. Hartenstein, Chairman, Ohio Edison Co., Akron, Ohio.

G. F. Dean	Glenn Park
C. C. Keller	Walter Sturrock
	L. C. Twichell

DEFENSE COORDINATING — To contact various government agencies concerned with national security suggesting cooperation and participation in specific projects as an aid to solution of their problems. Recommending the placement of lighting study projects in present committees or the appointment of study project committees to the Society President and to expedite such study projects and guide accepted reports into proper government channels.

J. W. Bateman, Co-Chairman, Canadian General Electric Co., Ltd., 212 King Street, W., Toronto, Ont.

A. F. Wakefield, Co-Chairman, The Wakefield Co., 721 S. Water St., Vermilion, Ohio.

H. R. Blackwell	O. P. Cleaver
R. B. Brown, Jr.	John S. Walsh

HISTORICAL — To assemble and make available for current reference and to prepare in suitable and durable form for posterity such historical facts, printed memorabilia, photographs, voice records, museum specimens and allied items as may be judged worthy of composing a continuing digest of the record of the Society's history.

S. B. Williams, Chairman, Brooks St., Jamestown, R. I.

Julius Daniels, Vice-Chairman, Boston Edison Co., 39 Boylston St., Boston, Mass.

W. F. Bear	S. G. Hibben
James Cravath	H. L. Logan
Leo Dolkart	J. L. Stair
C. A. B. Halvorson	G. E. Stickney

LIGHTING SERVICE — To stimulate and promote the discussion and practical application of lighting recommendations.

C. W. McCormick, Chairman, Connecticut Light & Power Co., P. O. Box 2010, Hartford, Conn.

A. C. Brodeur, Jr.	Carlton Thompson
W. E. Damuck	C. E. Waldron
R. F. Hartenstein	M. N. Waterman
J. D. Mitchell	J. D. Whitnell
Joseph Thomas	J. C. Wilson

MEDAL AWARD — To evaluate the eligibility of candidates for award of the IES Medal according to procedures approved by the Council.

R. F. Hartenstein, Chairman, Ohio Edison Co., Akron, Ohio.

(*Continued on page 41A*)

NEW WESTINGHOUSE SUPER-HI™

FLUORESCENT LAMPS GIVE 2½ TIMES THE LIGHT OF ORDINARY FLUORESCENTS

REGULAR 40-WATT FLUORESCENT LAMPS in this manufacturing area provide only 21 foot-candles of illumination on work surfaces.

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- **√ Special cooling chambers maintain proper vapor pressure to give longer life . . . more light.**
- **√ Longer life cathodes add to lamp life.**
- **√ New Chromium-Vanadium plating on lead wires retards end-darkening.**
- **√ Smooth slim design gives uninterrupted brightness all around the tube . . . much lighter weight for safe and easy handling.**
- **√ Interchangeable . . . can be used in any fixtures designed for new extra Hi-Output lamps.**
- **√ More reliable starting even in damp weather . . . special silicone coating over exterior surface of the lamp prevents collection of moisture.**

All Westinghouse fluorescent lamps have "Ultralume"™ phosphors to assure maximum brightness for the life of the lamp. There's one for every industrial, business and home use. Specify Westinghouse on every lamp order. Call your local authorized Westinghouse agent or write—Westinghouse Lamp Division, Bloomfield, N. J.

YOU CAN BE SURE...if it's Westinghouse (W) FLUORESCENT LAMPS

(*Continued from page* 39A)

Julius Daniels — K. M. Reid
M. B. Hastings — A. F. Wakefield
H. H. Magdsick — M. N. Waterman
J. F. Whitehead

MEMBERSHIP — To develop plans and supervise the operation of the individual membership activity of the Society.

J. C. Forbes, Chairman, General Electric Co., Nela Park, Cleveland 12, Ohio.

Brooks Chassaing — Gerald Marks
Jack T. Cottingham — Max D. Orr
Roy E. Dahlin — Eustace J. Perkins
Earl I. Dinsmore — Joseph Thomas
Mildred S. Ditzel — Allan S. Turner, Jr.
Judd Lough — John S. Williams, IV

NATIONAL TECHNICAL CONFERENCE — To be completely responsible, subject to the approval of Council, for the general coordination of all conference activities, for selecting and recommending time and place, for review of the plans and budgets of the National Technical Conference Executive Committee, and in cooperation with the Papers Committee for the satisfactory time allocation for the Technical Papers sessions, according to Procedures and Policies as adopted by Council.

C. L. Amick, Chairman, Day-Brite Lighting Inc., 5411 Bulwer Ave., St. Louis 7, Mo.

J. A. Barnes — J. D. Mitchell
J. W. Bateman — J. S. Schuchert
Brooks Chassaing — F. W. Sell
J. C. Forbes — C. C. Shotwell
W. P. Lowell, Jr. — J. S. Walsh
C. W. McCormick — J. C. Wilson

1959 Conference Executive Committee

J. S. Walsh, Chairman, Pacific Gas & Electric Co., 245 Market St., San Francisco, Calif.

Arthur S. Tylor, Operations Vice-Chairman, 1037 Cortes Ave., Burlingame, Calif.

William L. Friend, Program Vice-Chairman, Sylvania Electric Products Inc., 1511 Adrian Dr., Burlingame, Calif.

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Charles Buchanan — R. L. Sawyier, Jr.
J. H. Burson — D. D. Scarff
W. A. Cyr — R. A. D. Schwartz
Frank Duhme — G. A. Trosper

PUBLIC RELATIONS AND INFORMATION — To prepare and disseminate information about the activities, accomplishments, programs, objectives and policies of the Society and about the place of illuminating engineering in modern society; to formulate and submit public relations policies and plans to the Society.

W. A. Dalrymple, Chairman, Amalgamated Electric Corp., Ltd., 384 Pape Ave., Toronto, Ont.

John Ronayne — R. W. Sclater
L. E. Tayler

REGIONAL ACTIVITIES — To represent the respective Regions before the Council and to keep the Council informed regarding the affairs of the Regions. To stimulate Society activities, to encourage joint meetings of Sections and Chapters including Regional Conferences within the respective Regions, and to promote the expansion of the Society.

R. G. Slauer, Chairman, Sylvania Electric Products Inc., One 48th St., Wheeling, W. Va.

J. A. Banton — A. Eugene Fleming
J. A. Barnes — J. M. Gensburger
Robert Brown — C. C. Shotwell
Brooks Chassaing — R. L. Smart
J. B. Deck, Jr. — B. A. Travis
J. Carl Wilson

RESIDENCE LIGHTING FORUMS — To stimulate and assist the Residence Lighting Forums of the Society and to encourage the formation of additional Forums. To conduct a Residence Lighting Forum in connection with the National Technical Conference.

Virginia Skinner, Chairman, Long Island Lighting Co., 175 Old Country Road, Hicksville, N. Y.

Marianne Battig — William Hinckley
Clarence Cockrell — T. S. Kelly
Dorothy Davis — Ruth Lieb
Benjamin Duhov — Ruth Morris
Eve Freyer — T. T. Peake
Lloyd Gabler — Mary Pelkonen
Benjamin Goodman — J. Vernon Sharp
Robert Haskell — Margaret Summers
Mary Webber

SUSTAINING MEMBERSHIP — To develop plans and supervise the operation of the Sustaining Membership activity in the Society according to the Procedures and Policies adopted by Council.

J. S. Schuchert, Chairman, Duquesne Light Co., 435 Sixth Ave., Pittsburgh, Pa.

B. F. Benning — B. J. Jensen
Warren Booth — Carter Lewis
E. H. Church — C. C. Shotwell
E. C. Huerkamp — L. E. Tayler
E. J. White

TRUSTEES, I.E.S. HEADQUARTERS RETIREMENT PENSION PLAN

M. N. Waterman, Chairman, Westinghouse Electric Corp., Bloomfield, N. J.

G. F. Dean — W. P. Lowell, Jr.
K. M. Reid

TASK COMMITTEES

I.E.S. - U. S. PUBLIC HEALTH SERVICE — To outline a method of making a survey of the visual factors of the working environment and the workers' vision and evaluating the findings in terms of visual comfort and effectiveness and eye health.

J. F. Parsons, Chairman, Niagara Mohawk Power Corp., Electric Bldg., Buffalo 3, N. Y.

H. N. Doyle, Vice-Chairman, U. S. Public Health Service, Washington 25, D. C.

Mrs. Tula Brocard — Neal Jacobus
L. J. Cahill — A. L. Koven
George Clayton — R. P. Teele

TECHNICAL COMMITTEES

AVIATION AND SIGNAL — To study the application of light and lighting to the spaces and functions involved in the operation of aircraft.

M. A. Warskow, Chairman, Airborne Instrument Laboratories, Inc., 160 Old Country Road, Mineola, N. Y.

F. C. Breckenridge, Technical Secretary, National Bureau of Standards, Washington 25, D. C.

Aircraft Lighting

Warren Hulke, Chairman, Soderberg Manufacturing Co., 628 S. Palm Ave., Alhambra, Calif.

W. E. Woodson, Secretary, Convair Corp., Division of General Dynamics, P. O. Box 1950, San Diego, Calif.

W. C. Fisher, Papers Coordinator, Bureau of Aeronautics, Dept. of Navy, Washington 25, D. C.

F. C. Ashe — W. D. Howell
E. Boghosian — J. P. Hoxie
F. B. Brady — W. A. Jensen
F. C. Breckenridge — G. M. Kevern
D. I. Coggins — D. C. Miller
H. A. Cramer — M. A. Mortensen
C. A. Douglas — T. H. Projector
I. Fagin — F. C. Shipley
S. R. Goldfarb — R. A. Stone
P. H. Greenlee — M. A. Warskow

Ground Lighting

R. J. Stefany, Chairman, Westinghouse Electric Corp., Bloomfield, N. J.

J. P. Hoxie, Secretary, Corning Glass Works, Corning, N. Y.

C. A. Douglas, Papers Coordinator, National Bureau of Standards, Washington 25, D. C.

J. F. Angier — W. A. Jensen
F. C. Ashe — G. M. Kevern
E. Boghosian — A. L. Lewis
F. B. Brady — J. K. Newell
F. C. Breckenridge — H. J. C. Pearson
W. D. Callaghan — W. A. Pennow
P. B. Clark — F. C. Shipley
G. K. Clement — L. C. Simpson
D. I. Coggins — L. C. Vipond
O. F. Farris — M. A. Warskow
J. S. Haney — J. P. Wilson
L. W. Hornfeck — A. B. Winters
W. E. Woodson

Signal Lighting

J. F. Angier, Chairman, 14 Valley View Ave., Washington 12, D. C.

T. G. Andrews — F. C. Breckenridge
H. R. Blackwell — C. A. Douglas
W. E. K. Middleton

COLOR — To study, evaluate and report on the effect of color in relation to the art and science of illumination.

R. C. Allison, Chairman, Engineering and Design Dept., The T. Eaton Co., Ltd., 190 Yonge St., Toronto 1, Ont.

W. E. Carswell — G. F. Dean

DAYLIGHTING — To study the problems involved in daylighting, develop recommended practices and report thereon.

J. W. Griffith, Chairman, Southern Methodist University, Industrial Engineering Dept., Dallas, Texas.

W. J. Arner — M. C. Kirkpatrick
L. E. Barbrow — E. M. Linforth
R. A. Boyd — W. F. Little
R. L. Biesele, Jr. — T. H. MacDonald
A. A. Brainerd — R. W. McKinley
H. S. Bull — E. C. Miles
E. W. Conover — F. W. Mowrey
Doyt Early — Philip O'Brien
Benj. H. Evans — R. H. Reed
W. B. Ewing — F. K. Sampson
C. D. Gibson — Paul W. Seagers
B. F. Greene — D. E. Spencer
J. S. Herbert — K. C. Welch
R. C. Kendall — O. P. Wenzler
H. F. Kingsbury — C. J. Youngblood

Revision of Recommended Practice for Daylighting

R. W. McKinley, Chairman, Pittsburgh Plate Glass Co., 1 Gateway Center, Pittsburgh 22, Pa.

W. J. Arner — R. C. Kendall
E. W. Conover — H. F. Kingsbury
W. B. Ewing — E. M. Linforth
B. F. Greene — T. H. MacDonald
R. M. Hanes — F. W. Mowrey
J. S. Herbert — C. J. Youngblood

DESIGN PRACTICE — To study published data on coefficients of utilization, room indexes, maintenance coefficients and other elements entering into calculations for lighting design; develop standard methods for use in Society publications and report thereon.

G. W. Clark, Chairman, Sylvania Electric Products Inc., One 48th St., Wheeling, W. Va.

Ward Harrison — H. A. Odle
J. J. Neidhart — E. H. Salter
Phelps Meaker — R. S. Wiseman

EDUCATION — To study and encourage lighting education and training for professional careers in schools, colleges and elsewhere; to prepare educational and training material on fundamental and advanced concepts of light and illumination, and to further its adoption in courses conducted by Sections and Chapters.

Alston Rodgers, Chairman, General Electric Co., Nela Park, Cleveland 12, Ohio.

(*Continued on page* 42A)

(Continued from page 41A)

Robert Allen	Gerald Marks
B. F. Avery	Roy A. Palmer
A. M. Bacalar	J. F. Parsons
O. P. Cleaver	R. C. Putnam
E. L. Fairchild	T. H. Shepherd
D. M. Finch	J. L. Tugman
W. A. Hedrich	Wm. Weibel
P. H. Hildebrand	R. S. Wiseman
H. W. Horn	R. E. Wozniak
R. B. Lusk	I. A. Yost

C. W. Zersen

ADVISORY MEMBERS

H. H. Magdsick	E. M. Strong

HANDBOOK REVISION—To revise and arrange the technical content of the Handbook; to lay out, plan and arrange for development of individual sections primarily through appropriate technical committees; to consult with the Publications Committee on its presentation of a suitable publication budget for Council approval; to be responsible to Council for the accuracy and treatment of material including the format and paging.

J. J. Neidhart, Chairman, The Miller Co., Meriden, Conn.

A. S. Almryde	W. H. Kahler
George Clark	R. W. Morris
Bruce Jensen	E. M. Strong

IES-ASAE (American Society of Agricultural Engineers), formerly Farm Lighting — To study the application of light and lighting of farm buildings, surrounding work areas and other rural locations and to report thereon.

Morris Lloyd, Chairman, Niagara Mohawk Power Corp., Buffalo 3, N. Y.

Ervin Baker	J. P. Schaenzer
J. P. Ditchman	M. O. Withed

D. E. Wiant

IES-ASHAE (American Society of Heating and Air-Conditioning Engineers) Joint Committee — To study the relationship between lighting and various factors that enter into the thermal environment and report thereon.

A. T. Jorn, Chairman, ASHAE Research Laboratory, 7218 Euclid Ave., Cleveland, Ohio.

INDUSTRIAL — To initiate, follow up and coordinate lighting study projects in the industrial field, review the reports of the various subcommittees in this field and make recommendations to Council.

L. G. Parks, Chairman, Ebasco Services, Inc., 2 Rector St., New York, N. Y.

Aircraft Manufacturing

J. G. Felton, Jr., Chairman, Sylvania Electric Products, Inc., 100 Fordyce St., Dallas, Texas.

Robert S. Clubley

Clothing

Norman Kridel, Chairman, Rochester Gas & Electric Co., 89 East Ave., Rochester, N. Y.

Electronics Industry

R. S. Clubley, Chairman, General Electric Co., Large Lamp Dept., 2747 South Malt Ave., Los Angeles 22, Calif.

Graphic Arts

Ralph Enghouser, Chairman, Sylvania Electric Products Inc., 4700 Parkside Ave., Philadelphia, Pa.

Outdoor Production Areas

H. A. Cook, Chairman, Detroit Edison Co., 2000 Second Ave., Detroit 26, Mich.

Sawmills

James Barnes, Chairman, Pacific Gas & Electric Co., P. O. Box 540, San Rafael, Calif.

INSTITUTIONS — To initiate, follow up and coordinate lighting study projects in the field of public buildings and private institutions, review the reports of the various study subcommittees in this field and make recommendations to Council.

R. D. Bradley, Chairman, Day-Brite Lighting Inc., 5411 Bulwer Ave., St. Louis, Mo.

Churches

George Shoemaker, Chairman, Philadelphia Electric Co., 311 S. Broad St., Philadelphia 5, Pa.

Anthony L. Bleecker	T. Norman Mansell
John E. Flynn	A. C. Sangster

Henrik W. Olsen

Hospitals

N. L. Griffin, Chairman, Dept. of Health, Education & Welfare, Public Health Service, Div. of Hospital & Medical Facilities, Washington 25, D. C.

John Adams	H. L. Logan
H. W. Alexander	R. C. Putnam
L. J. Buttolph	Paul Seagers
E. H. Greppin	Howard Sharp

Hotels

C. I. Sayles, Chairman, School of Hotel Administration, Cornell University, Ithaca, N. Y.

C. L. Cottrell	J. Fassett
H. E. D'Andrade	Francis Keally
Myrtle Fahsbender	F. B. Mills

LIGHT CONTROL AND EQUIPMENT DESIGN— Collect and correlate the knowledge and data on means and methods of controlling, directing, reflecting, transmitting and diffusing light and on the principles and practices of equipment design.

John T. McLaughlin, Chairman, Kelso-Burnett Electric Co., 223 W. Jackson Blvd., Chicago 6, Ill.

J. N. Robertson, Vice-Chairman, Los Angeles Dept. of Water and Power, Design and Construction Div., 405 S. Hill St., Los Angeles, Calif.

Milton Busan, Secretary, Day-Brite Lighting, Inc., 5411 Bulwer Ave., St. Louis, Mo.

G. R. Baumgartner	J. S. Hamel
Warren O. Benjamin	Maurice E. Robertson
Eric H. Church	William Weibel
C. M. Holden	F. C. Winkler

Paul Woodland

LIGHT SOURCES — To correlate and report available information as to the physics of light and light production and the characteristics of current light sources.

George Freeman, Chairman, Westinghouse Electric Corp., Bloomfield, N. J.

Herbert A. Anderson, Vice-Chairman, Duro-Test Corp., N. Bergen, N. J.

L. E. Barbrow	Grant Davidson
W. P. Carpenter	R. B. Dull
R. D. Churchill	Walter Houston
Frank Clark	Charles W. Jerome
David Cutler	E. F. Kelly

E. H. Salter

Color Rendition

Dorothy Nickerson, Chairman, 2039 New Hampshire Ave. N. W., Washington 9, D. C.

E. W. Beggs	Norman Macbeth
C. N. Clark	G. R. Stillwell
C. W. Jerome	Luke Thorington
D. B. Judd	Arthur Weeks

Gunter Wyszecki

MAINTENANCE — To study the elements contributing to maintenance factors; set up the framework of typical field studies to determine factors; and to stimulate the prosecution of such studies by appropriate agencies.

Maxwell L. Trostle, Chairman, Sylvania Electric Products, Inc., One 48th St., Wheeling, W. Va.

R. D. Bradley	C. M. Holden
A. A. Brainerd	Howard Long
Francis Clark	D. R. Philips
L. M. Endres	F. J. Roche
R. R. Enghouser	R. P. Teele
W. C. Fink, Jr.	R. L. Zahour

MOTOR VEHICLE (EXTERIOR) — To study the problems of illuminating the night operations of motor vehicles and to make suitable recommendations for promoting maximum safety and convenience including accessory illuminated signal and traffic aids.

NOMENCLATURE — To define the terms and standards of illumination, and endeavor to obtain uniformity in nomenclature.

S. K. Guth, Chairman, General Electric Co., Nela Park, Cleveland 12, Ohio.

E. Q. Adams	D. M. Finch
Abraham Abramowitz	J. O. Kraehenbuehl
L. E. Barbrow	W. F. Little
George Clark	Philip O'Brien
C. L. Cottrell	Priscilla Presbrey

Harris Reinhardt

OFFICE — To study the lighting requirements of office lighting tasks, develop suitable lighting recommendations and report thereon.

Eric Church, Chairman, Lighting Products, Inc., P. O. Box 338, Highland Park, Ill.

John T. McLaughlin	John Sweattie

PROGRESS — To keep in touch with developments in the art of lighting throughout the world and prepare a yearly review of achievements in the art of illuminating engineering for inclusion in ILLUMINATING ENGINEERING.

E. A. Linaday, Chairman, General Electric Co., Nela Park, Cleveland 12, Ohio.

M. K. Strang, Vice-Chairman, Curtis Lighting of Canada Ltd., 195 Wicksteed Ave., Leaside, Toronto 17, Ont.

R. C. Allison	A. R. Jaeger
E. D. Altree	W. S. Kolb
H. A. Anderson	F. J. Marriett
E. W. Beggs	J. H. McCulloch
L. R. Buah	T. C. Sargent
J. T. Chambers	R. P. Teele
R. E. Faucett	Robert R. Tipton
B. Goldberg	M. L. Trostle
John Gornet	H. A. Williams

PUBLIC CONVEYANCES — Interior Lighting — To study the application of light to all public areas in conveyances used for passenger transportation, including particularly trains, buses, ships, street railways and subways, and report thereon.

E. Boghosian, Chairman, Dept. of the Navy, Bureau of Ships, Code #560, Washington 25, D. C.

J. B. Feder, Vice-Chairman, 4349 Verplanck, N. W., Washington 16, D. C.

A. L. Aremberg	J. B. Spillane
C. E. Egeler	J. L. Swarner
E. B. Hallman	R. L. Sweeney
R. L. Henderson	R. M. Timmins
T. S. Madonia	A. Vandevelde
F. T. Snider	W. C. Wheeler

Marine Transportation

R. Timmins, Chairman, Gibbs & Cox, Inc., 21 West St., New York, N. Y.

W. M. Adrian	R. Keuhne
E. Boghosian	T. S. Madonia
J. B. Feder	Lt. J. A. Moody
E. A. Geary	R. L. Paugh
R. K. Johnson	R. L. Sweeney

A. F. Vandevelde

QUALITY AND QUANTITY OF ILLUMINATION, Recommendations for — To prepare recommendations of illumination levels, brightness limits and brightness relationships in form applicable to practices.

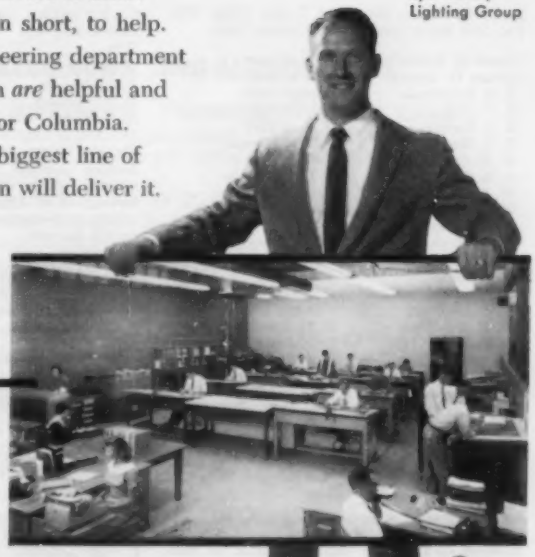
(Continued on page 44A)

COLUMBIA'S HELPFUL SALES ENGINEERS....

ON THE JOB IN A HURRY... WHEN YOU NEED THEM!

The term "helpful" applies to Columbia men. Their job is to serve the architects, engineers and contractors who specify and install Columbia fixtures. These men *know* fixtures. They are specialists . . . at your service to assist with specifications and layouts . . . to plan and advise . . . in short, to help. They bring to your assistance the services of our big engineering department if you need them. Our customers tell us that Columbia men *are* helpful and that they wear well. We like that. That's why they work for Columbia. Ask for our catalog. It contains full information about the biggest line of quality lighting fixtures in the business. Your Columbia man will deliver it.

eye-fi
MEMBER
Eye Fidelity
Lighting Group



Luminous Ceilings | Ceiling Modules | Recessed Coffers | Recessed Troffers

2' x 2', 4' x 4' Surface Units | 12", 24" Surface Units | Pendant and Surface Units | Industrial Units

COLUMBIA ELECTRIC & MANUFACTURING COMPANY

N. 2310 Fancher Way Dept. I-10 Spokane 10, Washington

(*Continued from page 42A*)

J. J. Neidhart, Chairman, The Miller Co., Meriden, Conn.

Willard Allphin	S. K. Guth
E. Boghosian	L. G. Parks
J. M. Chorlton	D. W. Rowten
E. H. Church	E. M. Strong
Lester Geis	M. A. Warskow
J. W. Griffith	W. W. Weld

RESIDENCE — To study and report on the application of light and lighting in residences; to develop performance recommendations for residence luminaires and to prepare necessary educational aids.

Measurement of Performance Characteristics of Portable Lamps

R. V. Smith, Chairman, Holophane Co., Inc., 342 Madison Ave., New York 17, N. Y.

A. R. Jaeger	Priscilla Presbrey
Kaye Leighton	Jan Reynolds

Revision of "Contemporary Lighting in Modern and Traditional Interiors"

Myrtle Fahsbender, Chairman, Westinghouse Electric Corp., Bloomfield, N. J.

Kaye Leighton — Gladys Miller
Jan Reynolds

Training Outline

Mary B. Taepke, Chairman, Detroit Edison Co., 2000 Second Ave., Detroit 26, Mich.

Elizabeth A. Meehan

ROADWAY — To establish the scientific principles underlying street and highway lighting; to collect data on the results of the application of such principles to actual practice; to prepare such reports thereon as will assist technicians and benefit the public.

Dana W. Rowten, Chairman, Westinghouse Electric Corp., 1216 W. 58th St., Cleveland 1, Ohio.

Thomas J. Seburn, Vice-Chairman, Bureau of Highway Traffic, Strathcona Hall, Yale University, New Haven, Conn.

L. F. Heckman, Secretary, Union Metal Mfg. Co., 143 Maple Ave., N.E., Canton, Ohio.

*David M. Baldwin	C. R. Minors
*James D. Blythe	F. E. Moesta, Jr.
R. P. Brotsman	*George Nagel
P. C. Box	*J. J. Oberhausen
R. S. Bucher	O. P. Ortlieb
P. B. Clark	*H. W. Osborne
W. F. Crosby	*R. J. Palmer
*A. R. Dow	*K. L. Partridge
W. H. Edman	Ellis E. Paul
W. B. Elmer	*Blair E. Plowman
J. H. Fahey	C. H. Rex
D. M. Finch	F. J. Schmitt
*H. A. Friede	*L. J. Schrenk
G. K. Glass	*S. E. Sisco
C. A. B. Halvorson	*J. Homer Shaw
*M. B. Hastings	*Edward L. Smith
W. E. Hawkins	R. M. Swetland
*R. M. Hoot	R. P. Teele
*Harry Hrivnats	D. A. Toenjes
M. E. Keck	G. A. Trosper
G. E. Korten	H. E. Wall
*R. A. Landry	R. C. Wey
*Albert Loreh	A. B. Winters
*R. B. Marxheimer	Henry Wojcik
H. E. Mason	R. R. Wylie
J. F. McGough	J. W. Young

R. M. Zabel

*Members only in advisory capacity.

SCHOOL — To study the application of light and lighting to the spaces and processes involved in educational institutions and to report thereon.

J. M. Chorlton, Chairman, Board of Education, 155 College St., Toronto 2B, Ont.

Carl Allen, Secretary, General Electric Co., Nela Park, Cleveland 12, Ohio.

Willard Allphin	W. H. Johnson
R. L. Biesele, Jr.	J. L. Kilpatrick
R. D. Bradley	C. N. Laupp
L. H. Brown	H. L. Logan
H. F. Davidson	J. D. MacConnell
A. A. Eastman	J. J. Neidhart
F. M. Foote	J. F. Parsons
W. V. C. Foulke	R. C. Putnam
R. L. Hamon	F. K. Sampson
D. B. Harmon	Paul Seagers
R. C. Hultgren	E. M. Strong
L. V. James	H. A. Stroud
Chester Jarrett	J. S. Walsh

K. C. Welch

Chalkboards

H. F. Davidson, Chairman, Curtis Lighting of Canada Ltd., 195 Wicksteed Ave., Leaside, Toronto, Ont.

Electric Lighting Design

J. F. Parsons, Chairman, Niagara-Mohawk Power Corp., Electric Bldg., Buffalo 3, N. Y.

Student Vision and Scholarship

A. A. Eastman, Chairman, General Electric Co., Nela Park, Cleveland 12, Ohio.

Visual Problems

Paul Seagers, Chairman, School of Education, Indiana University, Bloomington, Ind.

SEARCHLIGHT — To study the design and application of searchlights and to report thereon.

J. P. Latil, Chairman, Genarco, Inc., 97-04 Sutphin Blvd., Jamaica 35, N. Y.

Stewart Belden	Arthur Hatch
Ernest Boghosian	Robert Heine-Geldern
F. E. Carlson	Charles A. Hern
Thomas W. Cushing	G. M. Kevern
Pierre Demoreuille	Harold Korbel
R. B. Dull	Peter Mole
C. E. Egeler	T. I. Monahan
R. E. Faucett	L. R. Noffsinger
B. R. Finch	W. A. Pennow
C. J. Glass	Don Peterson
D. S. Gustin	T. H. Projector
J. S. Haney	S. Resnick

A. P. Waadyke

SIGN LIGHTING — To study the lighting of signs, both exterior and interior and report thereon.

C. N. Laupp, Chairman, Wisconsin Electric Power Co., 231 W. Michigan St., Milwaukee, Wis.

M. R. Ely	W.H. Kahler
R. E. Faucett	E. E. Kinney
H. B. Fletcher	R. J. Neu
A. L. Hart	M. F. McCann

SPORTS AND RECREATIONAL AREAS — To develop current recommended practices for lighting sports and recreational areas; study techniques of application including effects on player performance and spectator visibility and report thereon.

Wallace W. Weld, Chairman, Revere Electrical Mfg. Co., 6009 Broadway, Chicago 40, Ill.

M. W. Ross, Secretary, Commonwealth Edison Co., 72 W. Adams St., Chicago 90, Ill.

James Bale	W. P. Graham
J. W. Bateman	Howard Long
D. R. Brown	Edward Machtinger
R. H. Dickinson	John Mucha
R. T. Dorsey	D. E. Trefry
R. E. Faucett	H. M. White

STORE — To study the application of light and lighting to the spaces and processes involved in the selling of goods and to report thereon.

Lester Geis, Chairman, Garden City Plating & Mfg. Co., 23 W. 47th St., New York, N. Y.
G. G. Rae, Vice-Chairman, Holophane Co. Inc., 342 Madison Ave., New York 17, N. Y.

Ted Ako	Herbert Hoffman
R. C. Allison	Richard Kelly
D. P. Caverly	W. H. Kahler
L. H. Dickelman	N. J. Sonnenfeld
R. T. Dorsey	K. C. Welch

Revision of Store Lighting Guide

R. T. Dorsey, Chairman, General Electric Co., Nela Park, Cleveland 12, Ohio.

Service Stations and Parking Areas

E. H. Schaefer, Chairman, Wisconsin Electric Power Co., 231 W. Michigan St., Milwaukee 3, Wis.

James Bale	H. A. Elwell
W. G. Barr	J. R. Fairweather
Fred Bahls	A. L. Hart
D. B. Brown	M. C. Harsh
C. M. Cutler	Frank Lago

A. B. Winters

TESTING PROCEDURES — To prepare standard test procedures for illumination characteristics of light sources, lighting equipment and illumination materials and to report thereon.

A. W. Weeks, Chairman, Champion Lamp Works, 330 Lynnway, Lynn, Mass.

J. E. Bock	C. E. Leberknight
R. D. Bradley	T. H. Leister
G. E. Davidson	J. H. McCulloch
Don Davis	Phelps Meaker
Stephen Downey	G. A. Meyers
D. M. Finch	F. M. Neal
J. S. Franklin	Priscilla Presbrey
W. G. Hill	E. H. Salter
G. A. Horton	R. L. Smith
W. H. Houston	R. P. Teele
B. F. Jones	Maxwell Trostle
A. E. Krawcek	W. W. Weld
Paul Lamson	E. H. Witte

P. L. Young

THEATER-TELEVISION — To study and report on the lighting for theatrical presentations and for production of television programs.

Joel E. Rubin, Chairman, Kliegl Bros., 321 W. 50th St., New York, N. Y.

Alfred W. Boylen	Herbert A. Kliegl
C. S. Bramley	Herbert More
T. W. Butler	Walter O'Meara
Ariel R. Davis	Kenneth M. Palius
Gilbert J. deStefano	Arthur C. Risser
D. W. Frick	Hunton D. Sellman
Theodore Fuchs	George C. Smedberg
Walter H. Garrett, Jr.	Rollo G. Williams
George T. Howard	Willett R. Wilson

Robert L. Zahour

January 30 Is Deadline For 1959 Conference Paper Outlines

The Papers Committee of IES has set a deadline of January 30, 1959, for outlines of proposed papers for the 1959 National Technical Conference. Outlines of proposed papers, in triplicate, should be mailed to:

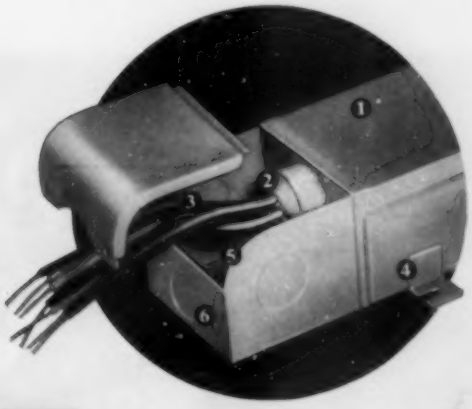
Floyd W. Sell
c/o The Detroit Edison Company
2000 Second Avenue
Detroit 26, Michigan.

GUARANTEED ABSOLUTELY WEATHERPROOF

JEFFERSON FLUORESCENT BALLAST

FOR HIGHWAY LIGHTING, AREA LIGHTING, BILLBOARDS, AND PLASTIC SIGNS

The new Nor'easter—first fluorescent ballast that is completely weatherproof—guaranteed against service failure due to weather conditions for 2 years.



❶ **WEATHERPROOF, CORROSION-PROOF CASE** Entire case is hot-dip galvanized. After ballast assembly, the seams of the lid are *sealed* to form a completely weather-tight unit.

❷ **AQUALIFT SEALED PIPE NIPPLE**—Jefferson's exclusive Aqualift Sealant prevents moisture from entering through the pipe nipple—retains its sealing properties thru extremes of heat and cold.

❸ **NEOPRENE LEADS** will withstand exposure to weather and temperature changes without deterioration.

❹ **HEAVY GAUGE MOUNTING**—Extra heavy mounting brackets.

EASY INSTALLATION

Mount it in any position—this ballast has no "upside down" or "backwards"

❺ **LARGE, EASILY ACCESSIBLE WIRING COMPARTMENT**—open on two sides—conduit lock nuts easily secured.

❻ **FOUR KNOCKOUTS**—on either side, bottom, and end of ballast.

Models available for 800, 1400 and 1500 M.A. lamps. Send for complete information—temp. ratings, dimensions, weights, and electrical specifications.

Jefferson WEATHERPROOF BALLASTS

Jefferson Electric Company, Bellwood, Illinois

(*Continued from page 38A*)

Secretary—KENNETH STINES, 222 S. Victoria Ave., Pueblo, Colo.

South Plains Chapter — Southwestern Region
Chairman—ARTHUR C. WAGHORNE, 3212 26th St., Lubbock, Texas.
Secretary — FRANK KILCREASE, 2114 38th St., Lubbock, Texas.

Suwannee River Chapter — Southeastern Region
Chairman—RAY A. MCMICHAEL, Georgia Power Co., Valdosta, Ga.
Secretary — ARTHUR T. CRABTREE, Union Electric Supply Co., 207 W. Hill St., Valdosta, Ga.

Tar Heel Section — Southeastern Region
Chairman — JAMES A. LOWE, Duke Power Co., 217 N. Elm St., Greensboro, N. C.
Secretary — EUGENE C. GATEWOOD, 4400 Collingwood Drive, Charlotte, N. C.

Tennessee Valley Section — South Central Region
Chairman — JAMES D. HARRIS, Nashville Electric Service, 1214 Church St., Nashville, Tenn.
Secretary—WILLIAM E. JONES, Nashville Electric Service, 1214 Church St., Nashville, Tenn.

Toronto Section — Canadian Region
Chairman — E. MACHTINGER, Crouse-Hinds Co. of Canada, Ltd., 1160 Birchmount Rd., Scarboro, Ont.
Secretary — A. W. HENSCHELL, 51 Wellington St. W., Toronto, Ont.

Twin City Section — Midwestern Region
Chairman — F. T. TILLEMANS, Westinghouse Electric Corp., 2303 Kennedy St. N. E., Minneapolis, Minn.
Secretary — JOHN BAHNAK, 711 S. Lake St., Minneapolis, Minn.

Twin Ports Chapter — Midwestern Region
Chairman — ERIC G. NYLUND, Nylund Electric, 5723 Grand Ave., Duluth, Minn.
Secretary — JOHN E. NORLAND, C. O. Solberg & Associates, 1402 Alworth Bldg., Duluth, Minn.

Utah Section — Inter-Mountain Region
Chairman — JACK W. LOWDER, Stevens Sales Co., Box 2338, Salt Lake City, Utah.
Secretary — HOMER S. SHERWOOD, Utah Power & Light Co., Box 899, Salt Lake City, Utah.

Vancouver Island Chapter — Pacific Northwest Region
Chairman — W. G. MCINTOSH, 43 Songhees Rd., Victoria, B. C.
Secretary — WALTER E. BEEK, B. C. Electric Co., Ltd., 820 Pandora Ave., Victoria, B. C.

Virginia Section — East Central Region
Chairman — THOMAS P. HARRIS, JR., 6037 Bonneau Rd., Richmond, Va.
Secretary — LUTHER S. REAMS, Yarmouth Circle, Richmond, Va.

Western Michigan Section — Great Lakes Region
Chairman — WILLIAM WINGLAR, 4123 Chicago Dr., Grandville, Mich.
Secretary — S. A. FAREN, Graybar Electric Co. Inc., 432 Monroe Ave. N. W., Grand Rapids, Mich.

Western New York Section — Great Lakes Region
Chairman — ROBERT R. HERGET, Robertson Electric Co. Inc., 126 S. Elmwood Ave., Buffalo, N. Y.
Secretary — WILLIAM J. MCCARTHY, Niagara Mohawk Power Corp., 535 Washington, Buffalo, N. Y.

Winnipeg Chapter — Canadian Region
Chairman — A. C. BURNARD, Box 66, St. James P. O., St. James, Man.
Secretary — WILLIAM J. MCCARTHY, Niagara Winnipeg, Man.

Yankee Chapter — Northeastern Region
Chairman — B. D. BARRY, JR., 32 Knollwood Dr., E. Longmeadow, Springfield, Mass.
Secretary — E. H. CARPENTER, Hampden Electric Supply Co., 158 Maple St., Springfield, Mass.

Yosemite Chapter — South Pacific Coast Region
Chairman — IRWIN MCMATH, Pacific Gas & Electric Co., 1401 Fulton St., Fresno, Calif.
Secretary — E. F. BOWEN, City of Fresno, 2326 Fresno St., Fresno, Calif.

(*Lighting News continued from page 34A*)

ABOUT PEOPLE

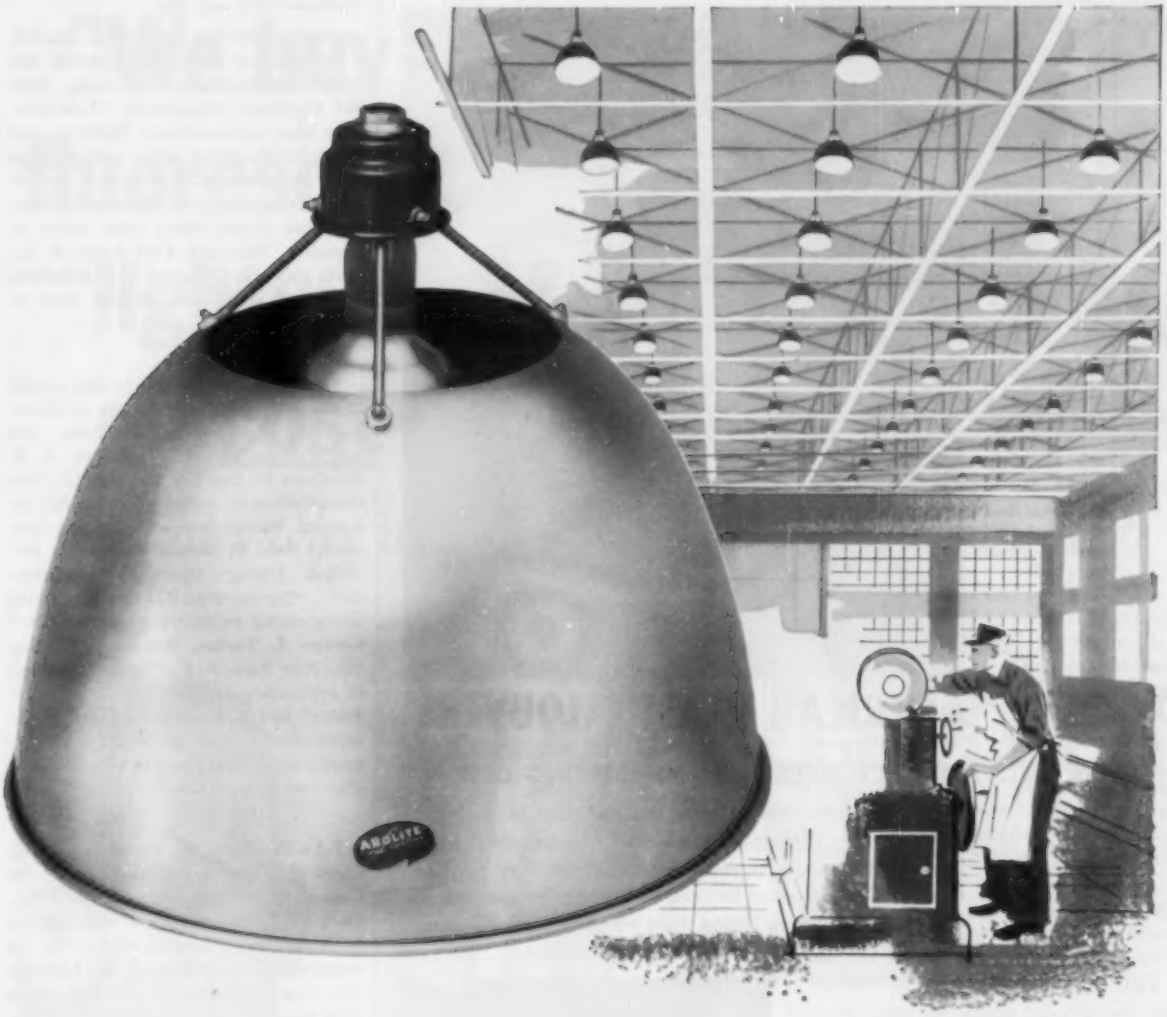
Joseph A. Schneller has been appointed to the newly-created post of manager of sales and marketing with the Quadrangle Manufacturing Co., Chicago, Ill. He will be directly responsible to **Dwight E. Worrell,** president of the company. Mr. Schneller was formerly connected with Lighting Products Inc., Highland Park, Ill., where he was vice-president in charge of sales and marketing. He has just completed a term as Midwestern Regional Vice-President of IES, and in the coming year will continue to serve on Council as a Director.

R. M. Johannesen, president of Johannesen Electric Co., Inc., Greensboro, N. C. has been selected as chairman of the National Electrical Week Plan Committee according to a recent announcement by **N. J. MacDonald,** chairman of the NEW Committee. Mr. Johannesen succeeds **Herbert E. Cook.** The ten-man plan committee serves as the planning and executive group within the committee which coordinates the activities of National Electrical Week, the all-industry event observed annually during the week of Edison's birthday, February 11.

Formation of a new Lamp Metal and Components Department of the General Electric Lamp Division, Nela Park, Cleveland, Ohio has been announced. **Robert F. Johnson** will serve as general

(*Continued on page 48A*)

OTTAWA Section's Annual Summer Picnic was held at the home of Warren and Jean Montabone. Past Canadian Regional Veep and present Society Director, Joe Thomas (at left in photo at left) talks with Jim Rylance, past Ottawa Section Chairman. In photo at right, Host Montabone (with megaphone) and some of the picknickers.



NOW ABOLITE BRINGS "OFFICE TYPE" EYE COMFORT TO INDUSTRIAL HIGH BAY LIGHTING

Eye fatigue is reduced, workers are more efficient with "glareless" high bay lighting from Abolite uplight units. Uncomfortable contrasts of bright lamps against dark background are eliminated by light directed upward through Abolite's open top. This light (18%) washes out the deep shadows, gives lamps a soft background. 35° shielding practically eliminates glare.

Open-top design also gives Abolite high bay units a self-cleaning action that keeps maintenance at a minimum. Air circulates through the fixture and sweeps it clean of dulling dust.

There are four Abolite uplight units for high bay lighting: 18″ and 24″ diameter Alzak aluminum fixtures for use with 400 and 1000 watt mercury lamps; 14″ and 18″ Alzak aluminum fixtures for 500 watt incandescent lamps (ideal for gymnasium lighting). For full information on these units, see Sweet's Industrial Construction File, 12i/AB, or write *Abolite Lighting Division, The Jones Metal Products Company, West Lafayette, Ohio.*

ABOLITE *Lighting*

THE JONES METAL PRODUCTS COMPANY
West Lafayette, Ohio

BE SURE!

Specify AMERICAN PLASTIC LOUVERS

THE OUTSTANDING LOUVER FOR ANY LIGHTING DESIGN.

American Plastic Louvers offer the maximum in conformability for any lighting plan, whether it be industrial, institutional, commercial or retail. In application they may be employed in individual fixtures, full ceiling installations or any modular pattern. Strong, light weight louvers eliminate the need for costly heavy ceiling construction.

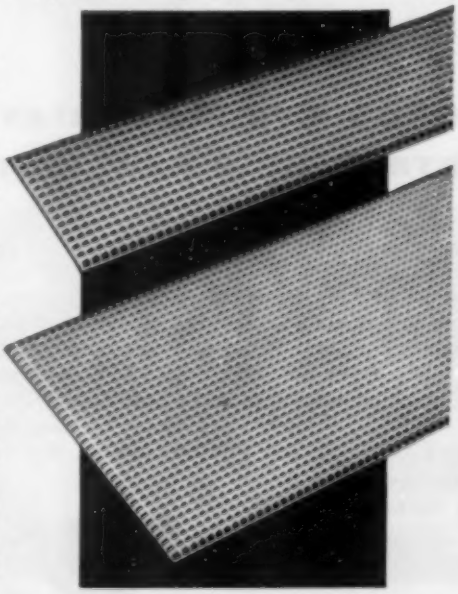
FEATURES..

- Color-Stable.
- Restful shielding regardless of the light intensity involved.
- Light Weight—Specific gravity of only 1.05.
- Low Cost Maintenance — Easy to clean.
- Available in combination of sizes.

Only the exclusive process of the American Louver Company is covered by these patents:

USA Pat. No. 2,566,817
USA Pat. No. 2,607,455
Canadian No. 484,346
Canadian No. 497,047

The next time you order, specify the ultimate in modern plastic louvers — get AMERICAN!



Write for additional details

american louver company

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(Continued from page 46a)

manager of the new department which is a consolidation of the Lamp Leads and Bases Department and the Lamp Wire and Phosphors Department. These comprise nine manufacturing facilities and associated functions which will continue their activities under the new department. Included are wire plants in Cleveland and Dover, Ohio; base plants in Conneaut, Ohio and Providence, R. I.; welds plants in Cleveland and Goldsboro, N. C. and a chemical products plant in Cleveland.

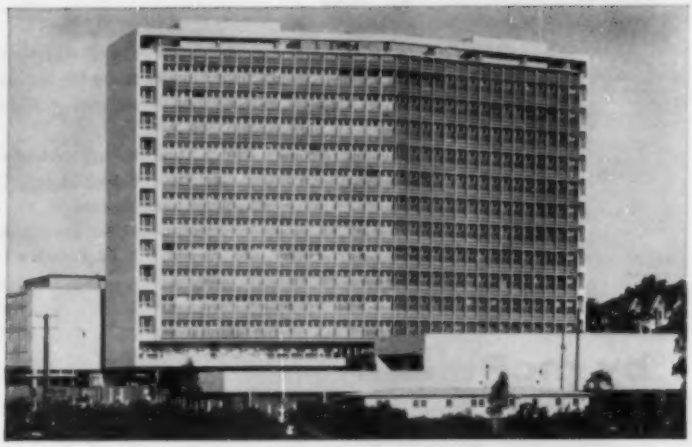
Four members of IES have been elected to the grade of Fellow by the American Institute of Electrical Engineers. The new Fellows are: **Leo Dolkart,** A. S. Schulman Electric Co., Chicago, Ill., "for contributions to design of diversified industrial distribution and lighting systems;" **Paul E. Shaad,** Sacramento Municipal Utility District, Sacramento, Calif., "for contributions in reorganizing and planning an electric power district;" **George J. Taylor,** Day-Brite Lighting Inc., New York, N. Y., "for contributions to application of electric lighting to industry" and **William P. Carpenter,** Superior Electric Co., Bristol, Conn., "for contributions to techniques of controlling electrical illumination."

John B. Deck, Jr., Texas Power and Light Co., Dallas, has been named by Council to serve as Regional Vice-President, Southwestern Region and member of Council until Sept. 30, 1959, filling the unexpired term of **Reuben K. Lothrop** who resigned because of ill health and is since deceased. Also appointed by Council at its August 22nd meeting was **Joseph A. Schneller,** Quadrangle Manufacturing Co., Chicago, as Director until Sept. 30, 1959. Mr. Schneller replaces **A. L. Sangster,** Detroit Edison Co., who found it necessary to resign.

Day-Brite Lighting Inc., St. Louis, Mo., has announced the appointment of **Gordon Wells** as southern regional sales manager. Mr. Wells, formerly represented Day-Brite in Virginia and North and South Carolina. This area will now be served by his four salesmen who will operate individual sales agencies as Day-Brite representatives. **John Manos** will serve Roanoke, Va. and Winston Salem, N. C.; **Roy Palmer, Jr.** will cover Raleigh and Durham, N. C.; **Earl Dagenhardt** will be the agent in Richmond, Newport News and Norfolk, Va. and **Ladd Massey** will be responsible for Charlotte, N. C. and Greenville, S. C. Mr. Wells' position involves the sales

(Continued on page 50A)

"We buy fluorescent lighting on cost



PEREIRA & LUCKMAN, ARCHITECTS

—*that's why we use General Electric Lamps!*"

"General Electric says one out of a thousand G-E Lamps may not light", comments Mr. Hack Lazerson (at left) of Solar Light Manufacturing Company in Los Angeles. "How come they're so modest?

"We provided 17,844 General Electric Lamps for the new Union Oil Company building. They were delivered to us; we installed them in our fixtures and then trucked them to the job. In routine assembly and testing, only two of the lamps which were installed failed to light.

"We've known all along, too, that G-E Lamps are practically maintenance free. Because, on the average, 99 out of 100 will still be burning after almost 2-years' use!"

For your customers who buy fluorescent lamps, such reliability is measurable in extra value, extra savings. They'll spend less on lighting if they *pay* less attention to the purchase price of the lamps, which is only 10% of the total cost of lighting anyhow, and more to *lamp performance*. They'll spend fewer man-hours removing, storing and returning the faulty lamps.

Your customers should buy lighting on *cost*—but point out that cost includes everything which affects their cost of light. And G-E Lamps are their best lighting value.

Call your local G-E Lamp Representative for the whole story—or write: General Electric Co., Large Lamp Department, C-838, Nela Park, Cleveland 12, Ohio.

OPERATION up turn

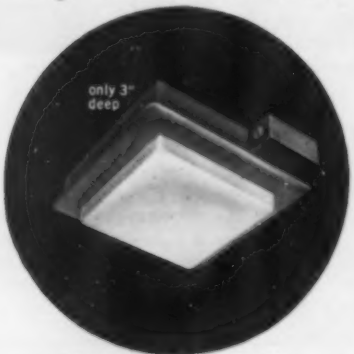
Progress Is Our Most Important Product

GENERAL ELECTRIC

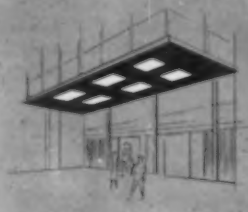
G-E LAMPS GIVE YOU MORE VALUE FOR ALL YOUR LIGHTING COSTS

recessed weathertight downlights

by mcPhilben



Cat. No. 4-815 150W



- 3" depth . . . ideal for CANOPIES, SHOWER ROOMS and other WET LOCATIONS
- cast aluminum quality
- anodized satin aluminum face plate for lasting beauty and protection against corrosion
- pouring forms . . . 16 ga. hot-dipped galvanized steel housing . . . saves the cost of framing out with wood
- continuous installations . . . "thru-way" junction boxes permit low cost 60° wire . . . U.L. approved
- twin Sealume gaskets "pre-solve" ceiling light-leak and dust-streak problems, effectively seals out rain and dampness

Ask your mcPhilben representative to show you these uniquely designed weathertights or write to mcPhilben Ask for data sheet A-24.

Sweet's 32e/MC

mc Philben
LIGHTING INC. BROOKLYN 37, NEW YORK
IN CANADA: DIVISION OF WAKEFIELD LIGHTING LIMITED LONDON, ONTARIO

(*Continued from page 48A*)

management for 11 southern states. He will continue to make his headquarters at 307-308 Builders Building, Charlotte.

James M. Gilbert, president of Silvray Lighting Inc., Bound Brook, N. J. has announced the formation of a special process and miniature lamp division. The new division will be concerned with the development and sale of reflectorized lamps. **Henry Engel,** market research specialist, has been appointed division manager.

Harold J. Flaherty has retired from the General Electric Co. Outdoor Lighting Department, Hendersonville, N. C. after 41 years of association. At the time of his retirement, Mr. Flaherty was engineering consultant and manager of his Department's engineering laboratory. He joined GE in 1917 as an arc lamp tester, and spent his entire career in the outdoor lighting field.

Appointment of **Kenneth S. Taylor** to the staff of sales engineers of Fluorescent Fixtures of California has been announced. Mr. Taylor will help service the Northwest territory in the distribution of All-Brite industrial and commercial fixtures.

Pittsburgh Reflector Co. has announced the recent addition of **Jerry F. Lachman** to the company's Philadelphia sales staff, with responsibilities for engineering, sales and service. Mr. Lachman was formerly a sales engineer with Leidy Electric Co., Phillipsburg, N. J.

Herbert K. Nock, southern regional sales manager for Smithcraft Lighting, Chelsea, Mass. has joined **Ken Hill** and Associates, Sales Agents, Mt. Dora, Fla. Mr. Nock will be responsible for the Ken Hill lines, including Smithcraft, in southeastern Florida.

Westinghouse Lighting Division has named **Harvey D. Chicoine** as plant manager for the Cleveland Works and **C. A. Fike** as assistant to the Division manager, according to a recent announcement. Mr. Chicoine's responsibilities will include all plant operations at the Cleveland factory as well as the activities of the industrial relations and purchasing departments. Mr. Fike, who joined the

90 Modern Infinite Preset Systems . . . 2-scene, 5-scene and 10-scene Preset Consoles . . . standard and cold Patch Panels . . . Architectural Systems . . . Load Programming Systems . . . space-saving, *money-saving* Magnetic Amplifier Dimmers. For a particular Lighting Control System to suit your particular requirements consult LUMITRON, the first name in Stage and TV lighting control design.
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Division of METROPOLITAN ELECTRIC MFG. CO.
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Lighting Division in 1935, will be responsible for the coordination of special projects in the Division. In the photominiature lamp department of Westinghouse in Bloomfield, N. J., **Philip F. Dietz** was appointed assistant to the manager, Frank M. Ogden. Mr. Dietz was most recently engineering manager of the miniature lamp department.

Robert J. Muir has joined the sales engineering staff of R. E. Dietz Co., Hazard Warning Lighting Division, Syracuse, N. Y. Mr. Muir will cover New England and eastern New York and Pennsylvania under the direction of **William Enbury**, northeast district sales engineer.

Sunbeam Lighting Co., Los Angeles, Calif., has announced the appointment of three new sales representatives. **Dave Samberg**, Electrical Sales Co., will cover the metropolitan New York City area;

(Continued on page 52A)

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. . . want to be associated with a national leader in the quality institutional and commercial field,
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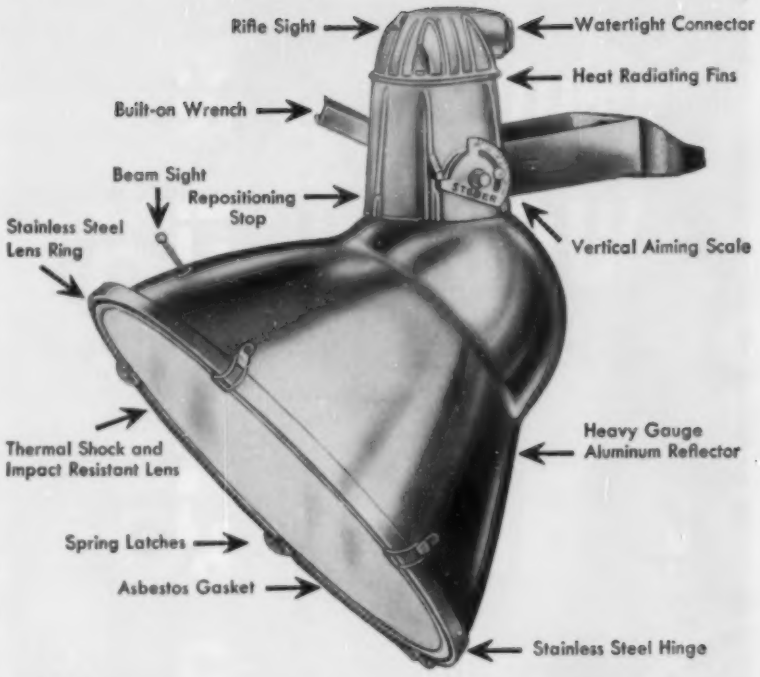

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metco Lighting
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(*Continued from page* 51A)

Bert Berend, Miami Beach, Fla., will service the state of Florida with the exception of Pensacola and the extreme northwestern part of the state, and the Sudan organization, Buffalo, N. Y., headed by **Walter D. Fitzpatrick** and **Martin M. Goldman,** will represent Sunbeam in western New York state.

The Thatcher Glass Manufacturing Co., **McKee** Division, Jeanette, Pa., is entering the lighting field of the glass industry with the appointment of **Hugh Claspy,** Monaca, Pa., as representative for illuminating wares. In 31 years with the **Phoenix** Glass Co., most recently as vice-president in charge of research and development, Mr. Claspy specialized in the design, production and sale of lighting products.

BOOKS AND PAMPHLETS

Engineering Consultants, published by American Institute of Consulting Engineers, 33 West 39th St., New York 18, N. Y. Prices: $2.50, cloth-bound; $1.50, paper-bound.

A new edition of the Directory of the American Institute of Consulting Engineers, containing lists of qualified engineers and their firms, biographical data and information on services performed, is now available. Also included in the book is a classified index for ease in locating engineers to handle particular problems.

Light Magic for Christmas, Westinghouse Electric Corp. Booklet A6950. Prices: $4.00 per 100 up to 499 copies; $3.50 per 100, 500 or more copies.

This idea booklet for Christmas lighting decoration can now be ordered from local Westinghouse lamp sales representatives. A set of 16 2" x 2" colored slides (Set XB) containing 11 exterior views and 5 interiors is available as a tie-in at $8.00 per set.

Trade Marks and Trade Names for Power Cables, Wire and Insulation, published by National Electrical Manufacturers Association, 155 East 44th St., New York 17, N. Y., 10 pp., 50 cents.

Revision of a compilation first issued in 1954 listing, according to product classification, trade marks and names of insulating materials and bare and insulated wire and cable used in the electric power industry is now available from NEMA's Wire and Cable Section.

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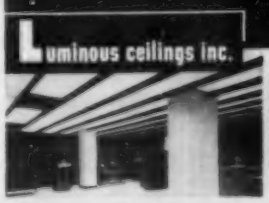
CONTROL SOUND
with NEW
SOUNDSHEET



Acusti-Luminous Ceiling with Corrugated Soundsheet. IBM Showroom, Chicago. Architect: Shaw, Metz & Dolle.

by CONTREX

Smithcraft Overall Illumination with Corrugated Soundsheet. Engineering Lab, Tufts U., Medford, Mass. Architect: W. A. Pollack, NEGEA Service Corp., Cambridge.

Sylvan-Aire Translighted Ceiling with Corrugated Soundsheet. Drafting Room, typical of Soundsheet's many applications.

Wakefield Ceiling '58 with Flat Soundsheet. Office area, The Mills Company, Cleveland. Architect: John T. Kelly, Cleveland.

"The miracle of sound and sight", Contrex Soundsheet Translucent Acoustical Element, is a basic architectural tool — featured in the lighting and acoustical equipment of the nation's leading manufacturers.

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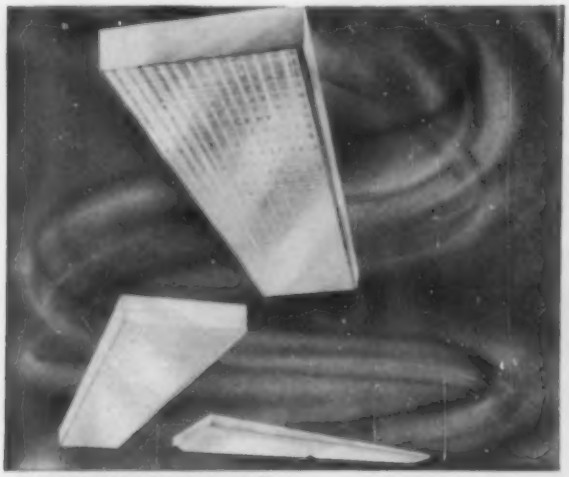

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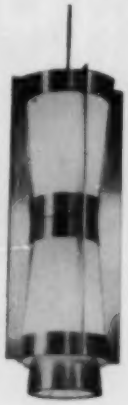
7 Stages Of Light



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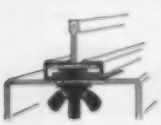

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							0-15% UPLIGHT						20-35% UPLIGHT			
#1	#2	#3	#4	#10	#40	MANUFACTURER	D-1 2-40w 1A-18	D-1 2-75w 1D	D-1 2-800 ma 1E	D-2 3-40w 2A-38	D-2 3-75w 2D	D-2 3-800 ma 2E	D-3 2-90 & 40w 2A-38	SD-1 2-40w 1A-18	SD-1 2-75w 1D	SD-1 2-800 ma 1E
5			1		1	ABOLITE LIGHTING DIV.										
3	5	3		1		APPLETON ELECTRIC CO.										
3	4	4		1		BENJAMIN ELECTRIC MFG. CO.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
						DAY-BRITE LIGHTING, INC.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
						EASTERN FIXTURE CO., INC.	✓	✓		✓						
4	4					ELECTRO LIGHTING CORP.	✓	✓					✓	✓		
						ENDER-MONARCH CORP.	✓	✓		✓						
						FLUORESCENT FIXTURES OF CALIFORNIA	✓	✓	✓	✓	✓	✓		✓	✓	
						GLOBE LIGHTING PRODUCTS, INC.	✓	✓		✓	✓				✓	
						THE EDWIN F. GUTH CO.	✓									
						KEYSTONE ELECTRIC MFG. CO.	✓	✓		✓	✓					
						LIGHTING DYNAMICS, INC.	✓	✓		✓	✓			✓	✓	
4			3			THE MILLER CO.	✓	✓	✓	✓	✓		✓	✓	✓	✓
						MITCHELL LIGHTING DIV.		✓		✓	✓					
4			2		1	MULTI ELECTRIC MFG., INC.	✓									
4	3	3				OVERBAGH & AYRES MFG. CO.										
5	3	5		2		QUADRANGLE MFG. CO.										
						RUBY-PHILITE CORP.	✓	✓	✓	✓	✓			✓	✓	✓
						SMITHCRAFT LIGHTING DIV.	✓	✓		✓	✓					
3	3	3				SMOOT-HOLMAN CO.	✓	✓	✓	✓	✓	✓		✓	✓	✓
4	1		1		1	THE SPERO ELECTRIC CO.										
4		2				THE STEBER MFG. CO.										
						SUNBEAM LIGHTING CO.	✓	✓	✓	✓	✓	✓		✓	✓	✓
						SYLVANIA ELECTRIC PRODUCTS, INC.	✓	✓	✓	✓	✓		✓	✓	✓	✓
3	4	2		2		WESTINGHOUSE ELECTRIC CORP.	✓	✓		✓	✓			✓	✓	
3	4	3				WHEELER REFLECTOR CO.	✓	✓	✓	✓	✓		✓	✓	✓	
						WORK-O-LITE CO.	✓	✓		✓	✓					

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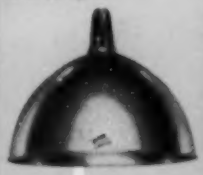

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